ELECTRICAL SOUTH

DECEMBER
1943

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55th SEASON

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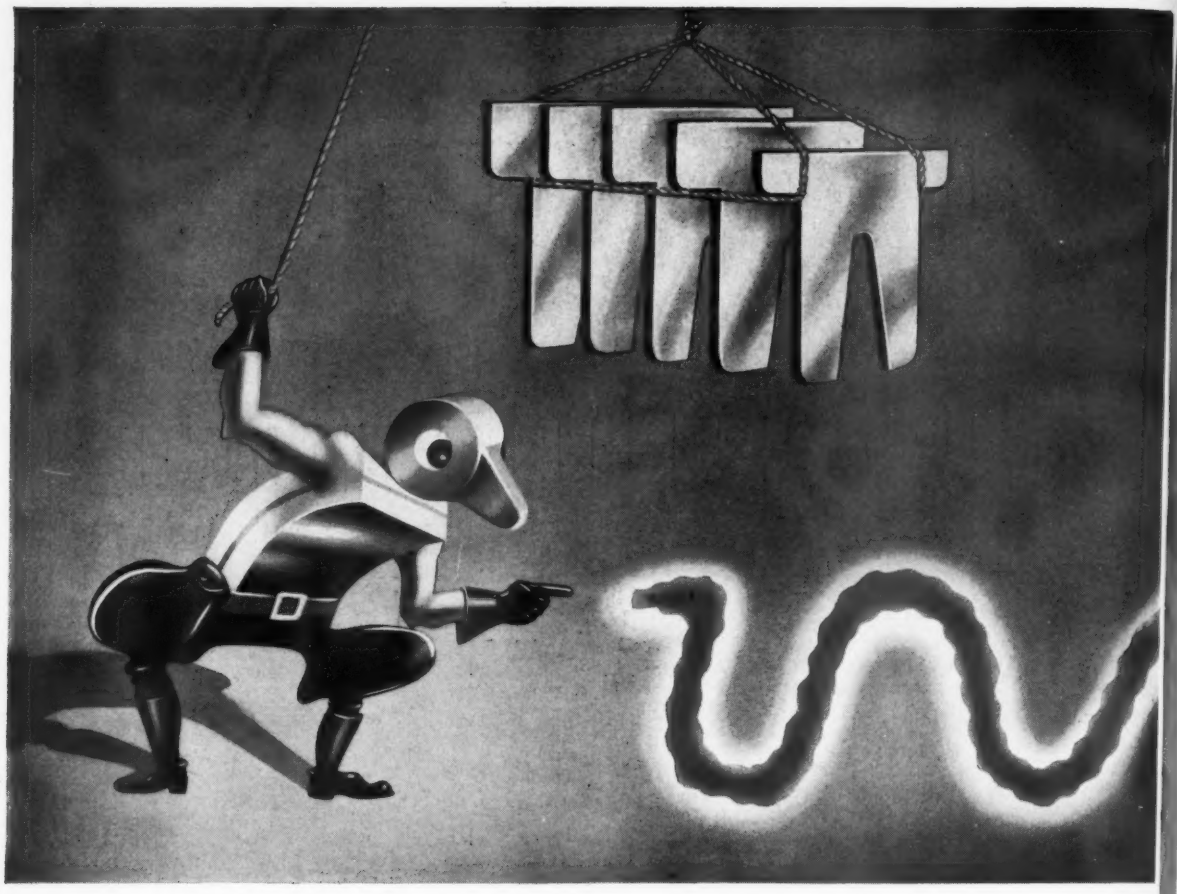
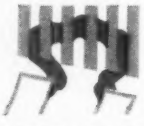


"one false move and you're Dead!"

THIS IS THE BRAIN that tells whether an overload is dangerous or not. It's Westinghouse Bi-metal. Two different metals which react differently under heat are bonded together. Dangerous overloads cause this Bi-metal to bend, tripping the interrupting mechanism, opening the circuit.



THIS IS THE BRAWN that quenches the arc. Made up of parallel metal plates in the form of a grid, it draws the arc into the chamber, divides it into segments and smothers it between the plates . . . it all happens in the space of half a cycle!

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With uncanny accuracy, this "De-ion" protective device outguesses the current, beats dangerous disturbances to the punch. Momentary, harmless overloads are passed without interruption; but when the circuit is actually threatened, the sensitive Bi-metal element goes into action, *quick!* The circuit's broken, the arc quenched, in the space of a blink of an eye.

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"DE-ION" CIRCUIT BREAKERS

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Volume 23 Number 12

MISSING

...yet still in action

For years, Manson Tape has occupied the highest position of all friction tapes. Whenever the utmost safety and permanence in splice protection was required, Manson Tape became the first choice of experienced engineers and electricians. Purchasing agents, too, willingly paid more to get lasting protection.

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UNTIL MANSON TAPE IS AGAIN AVAILABLE

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PASSAIC OKONITE NEW JERSEY

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Greater security for men

STOPPER! This piece of laminated glass just stopped a .50 cal. bullet. In battle it doubtless would have saved a life.

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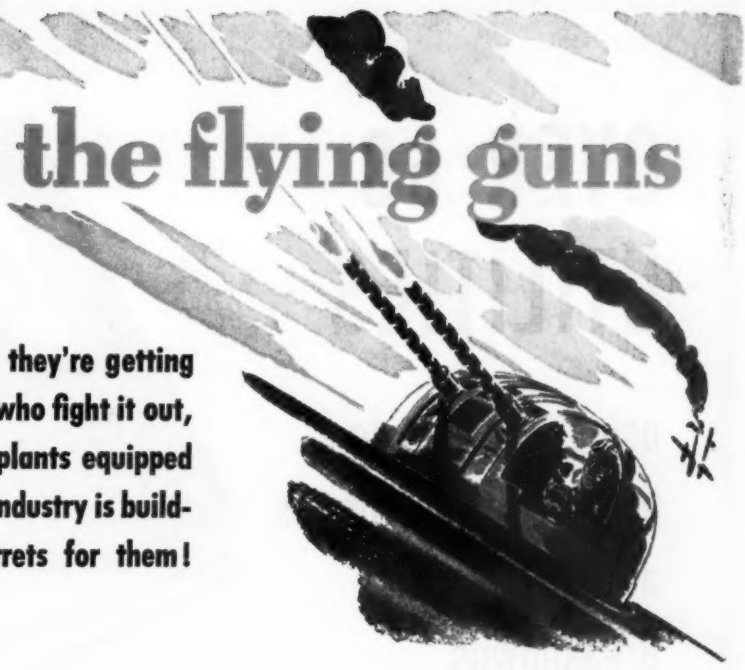
MAZDA LAMPS

FOR BETTER "SEE-ABILITY"

who man the flying guns



They deserve the best, and they're getting it, these brave young lads who fight it out, high in the sky. Today, in plants equipped for perfect *"See-ability,"* Industry is building amazing new gun turrets for them!

Pilot to Crew: "Fighters at 10 o'clock . . . *coming in fast!*"

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And throughout every step, from shaping the plastic to final inspection, "See-ability," through better, more scientific lighting, is helping men and women combine care and accuracy with speed and—still more speed.

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Company .....

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DECEMBER
1943

Volume 23 No. 12

ELECTRICAL SOUTH

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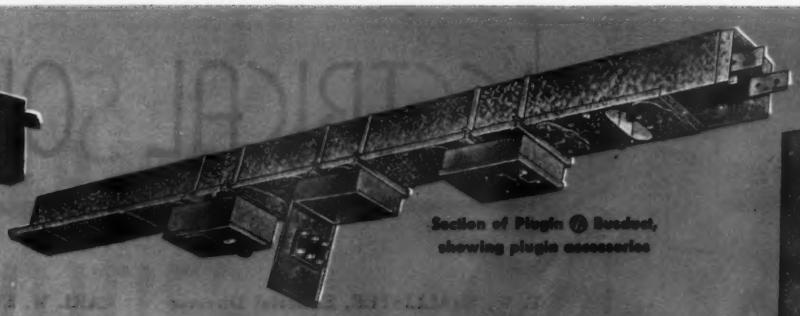

Section of Plugin (F) Busduct, showing plugin accessories

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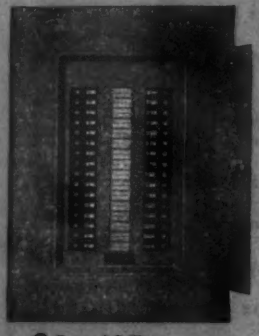
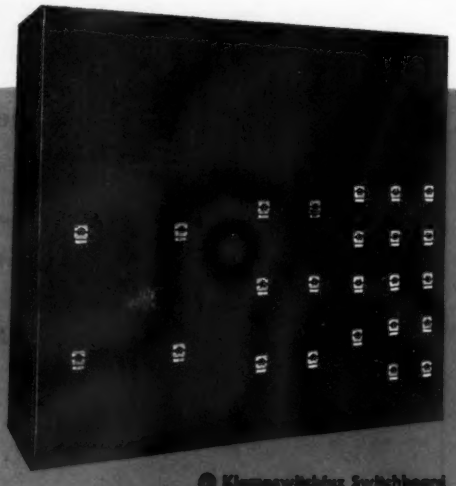
(F) Dust-tight Panelboard, with (F) Type AC Thermag Circuit Breakers



(F) Type AC Thermag Circuit Breaker Panelboard

(F) LNTP Panelboard

(F) Dublbrak Lighting and Appliance Branch Circuit Panelboard



(F) Klampswitchbox Switchboard

(F) Pulfuzswitch Distribution Panelboard

Distribution Problems In the Postwar Period

A distinguished marketing expert discusses methods of stabilizing appliance merchandising procedures and improving trade relations in the postwar period.

UPPERMOST in the minds of American citizens is the winning of the present global war. This does not preclude the diversion of many minds to a study of plans for winning the peace, because never has there been such an era of destruction of human and material values as in these war years and the reconstruction period will be long and difficult. Never has American industry met a challenge such as fulfilling the almost fantastic production demands for war materials. Factories were completely revamped and capacities increased manyfold.

As we of the utility industry attempt to chart a course by which we can formulate plans for postwar load building, we must study the impact of this industrial war effort on the markets for electrical service and the products of utilization. I will point out a few of the more important situations which appear to me to bear directly on peacetime distribution problems that concern the residential classification of utility services.

First, in formulating the broad base on which we build our postwar plans and hopes, Government's present investment in business is of chief concern. The stake of Government in war plants built, or expansion to old ones, is close to $20,000,000,000. Of this $20,000,000,000, 78 per cent or approximately $15,500,000,000 represents the contribution of the United States Treasury. Only about $4,500,000,000 were supplied privately. It is also pertinent that 100 of the large corporations were awarded 86 per cent in value of contracts in 1940. Efforts to protect smaller business reduced this percentage to 70 per cent of the basic contracts in 1942, but small business has been sharing mostly in subcontracts. What is going to be the picture when production for war is stopped? How will private business be able to finance the present investment of Government in it, assuming the Administration might be inclined to dispose of these plants? Answers to these questions must be found if the system we call Private Enterprise is to endure. Let us start with the assumption that business will not be in competition with Government, and the millions wanting employment will get jobs.

By C. E. Greenwood

Commercial Director for the Edison Electric Institute. This article was adapted from an address presented at a meeting of the Southeastern Electric Exchange, in Atlanta, on October 28, 1943.

Secondly, we hear discussion about what may be done along manufacturing lines, with these spare capacities for manufacturing durable goods of both privately-owned and publicly-controlled enterprises. The re-conversion problem will be stupendous. Therefore in the study of distribution plans the length of this re-conversion period and the new product timing are of major concern. War Production Board officials have suggested freezing of 1942 models of consumer products for a stated period following the close of the war. The automobile industry has already been approached, and an executive of a prominent electric refrigerator manufacturer has stated that their first postwar model will be their 1942 models. Others will follow suit. However, if that 1942 model refrigerator, range or what-not is on the postwar market, will you invest in one if the tools for newer and more drastically improved designs are in the making? As Vice-President Wallace stated before a recent Congressional Committee hearing: "When the veil of secrecy imposed by war is lifted, our people will stand amazed at the array of inventions."

Speculation running rampant among us can predict many of these new inventions and designs in the household appliance list—plastic refrigerators equipped with transparent lighted panels, electronic tubes for killing bacteria, and quick-freeze compartments; ranges with glass ovens and built-in cooking appliances; electric cooking by induction using regular 60-cycle energy

which is three times faster than regular heating units; zephyr weight vacuum cleaners with more power and changed design for easier operation; the completely automatic laundry machine that works; bent tubes for more artistic fluorescent lighting applications in homes; heating, cooling and dust-consuming units that perch on your window-sill; staticless radio, perhaps with television or perhaps with stockticker-type newspaper attachment. One manufacturer is currently advertising his postwar electri-steam iron that really looks like an iron.

There can be slight doubt that the electrical industry will have its share of these new products. There will be newcomers in the manufacturer group, names prominent perhaps in the industrial field but not previously emblazoned on any item of electric equipment. These producers have their own retail outlets established in other lines. Will they use them exclusively for distributing electrical items? There is evidence that they will. One of these industrials has publicized in the press its new Manager of the "Car and Home Merchandise Department." Another company handling similar lines, and with national distribution, is taking on electrical lines. Such policy will result in large expansion of electrical outlets.

Incidentally, do not be misled by the rumors of all the new manufacturer participation in the electric appliance market. There are those that have investigated and have changed their earlier plans. Others are definitely committed. In addition to the newcomers, there will be familiar manufacturers' names of high reputation on expanded lines of appliances. In fact, several complete lines will be offered in the electric household field.

Aspects of Future Market

Now a third point of interest is speculation on future market situations. Changes have come about in that pre-war market in which you promoted equipment. It appears that we will start our promotional plowing in richer soil because in just the period between January 1, 1940, and July, 1941, there were 4,500,000 families that moved into income levels over $1,000 per year and 6,000,000 moved over the $2,000 line into upper levels. These families want better living; they can be buyers of electric equipment. Money is coming to them now when there are less consumers' goods on which to spend it. Granted that we find gains in sales of such items as furs, liquors and jewelry of from 40 to 75 per cent, we are told by the U. S. Department of Commerce that 72 per cent of the middle income wage group is definitely accumulating a surplus for postwar buying.

One other notable change in our market concerns the plight of the white-collar worker. Over the past seven years salaries in this class have increased but 15 per cent while wages of labor are up 49 per cent. At the same time the tax power has been applied to the white-collar salary so that the loose money this man—you and I—have for spending has shrunk almost a third. The spending margin of the wage earner has increased approximately 92 per cent.

These sharp changes in the national economic structure give us food for thought. Fortunately the salaried group has enjoyed the benefits of electrical living in normal years. They have made investments in equipment in prewar days, but in this group will be a potential market for replacements.

We in the utility industry have observed a sharp gain in the prestige of household electric servants in these war months. As homes have been broken up when sons and daughters joined the armed forces, and other daughters and many mothers went to work in factories or performed war services, a new value has been placed on electrical servants for convenience and time-saving in housekeeping under trying circumstances. In Britain more and more dependence has been placed on electrical equipment. Damaged equipment in blitzed areas has been salvaged to keep similar servants operating elsewhere.

So in America today, women know and use electrical equipment more than ever before. Housemaids are in the class of "critical materials." The lack of such labor-savers when out of whack has been shown as an important factor in women absenteeism in war production plants. In this regard the washing machine and iron are tops. Incidentally the washing machine is tops in Britain too, because, according to a recent cable to the Wall Street Journal, "the Dean of Canterbury, having had personal wartime experience with the drudgery of housework, has been telling women in 200 towns of the virtues of American washing machines."

Appliance maintenance in wartime is of such importance that agencies in WPB, OCR, and OWU have been working toward the objectives of the release of essential metals to the manufacturers for an adequate supply of repair parts for the real labor-saving appliances, and even some replacement stocks are being planned for the coming year.

It is encouraging to find a sympathetic response by OPA for price adjustments which will enable utilities to undertake servicing without substantial losses as shown in past months, should there be a breakdown of other maintenance sources. It is of further interest that of the 194 utility companies answering a recent questionnaire 175 are now engaged in appliance repair work and these companies expect to continue this policy in peacetime.

The sympathetic response of these Government agencies to civilian needs expressed in assistance to manufacturers, utilities and dealers, is a helpful background to the National Appliance Conservation Program of Edison Electric Institute which is in process of development and soon to be officially announced.

Dealers Need Assistance

The dealers today are making a struggle for survival and need all utility assistance possible to give them, consistent with its protection of service responsibility to the electrical consumers. As Mr. Preston Arkwright, President of Georgia Power Company, an acknowledged leader in forward thinking, has said, "Our customers, when all is said and done, are the only real asset we have." And we add, it is the utility's responsibility to protect it.

Now my fifth observation on postwar distribution concerns retail outlets to serve these future markets under discussion. There is evidence that former practices may be modified in the light of competitive developments in the manufacturer branch of the industry. At the beginning of the war there were an estimated 50,000 dealers in electric equip-

ment of all classes, about 26,000 of them doing a business of more than $5,000 annually; the others less than that amount.

The holocaust of Pearl Harbor started a new era in the electric appliance industry. Manufacturer production schedules for most equipment slowed down and finally ceased as the demand for war materials became immediately urgent and plants were converted for all-out war effort. Limited items were still produced in the essential appliance list for industrial housing only. Wholesaler and dealer stocks of electrical equipment dwindled rapidly when consumers realized they were not to be able to buy again for the duration and a joyous seller's market was created.

Out of 194 utility companies previously referred to in a survey, 108 companies estimated the postwar mortality of electric dealers in the territory they served—assuming the war to continue through 1945—at 50 to 100 per cent. Sixteen companies indicated 100 per cent and nine companies expected no losses. Only 49 companies submitted estimates below 50 per cent.

Right here it is pertinent to ask a $64 question; namely, what part the electric utilities may take in postwar retail appliance distribution. I will be bold enough to make some comments on this controversial subject.

Following my very recent discussions with some representatives of other trades, I think they are more alarmed with the merchandising of competitive chain groups and cooperatives than with the electric utilities. However, there appears to be no reason for concern about this element of customer service, nor for further discussion while we are winning the war.

Cooperative Merchandising Plan

For those utilities that may join with the dealers in cooperative merchandising practices in postwar years I would suggest they take from their files a Statement of Merchandising Procedure prepared jointly a few years ago by utility executives and leading representatives of the trade. If these Principles of operation are somewhat dusty, it is only because the utilities so readily charted new merchandising plans that brought the dealer more actively into cooperation in selling, and there was no further requirement for that constant reminder from the trade of unfair competition. Hang this statement on the wall again. In substance here is how it reads:

It is recommended that electric utility companies take the initiative in bringing about conferences with dealers in their localities to the end that the following or other mutually acceptable procedure be recognized, adopted, and put into use for the purpose of stimulating the sale of suitable electric appliances and promoting the use of electric service in a way that will be mutually advantageous to the consuming public, the utility, the appliance manufacturer and all merchandising outlets.

1. The distribution of electric appliances should be on the basis of fair and open competition in the interest of the consuming public, the utility, the appliance manufacturer and all merchandising outlets.

2. No appliance or merchandise not directly related to the use of electricity should be sold by electric utilities.

3. In all merchandising activities the retail price of all electric appliances that have received reasonable customer acceptance should be consistent with present-day merchandising practices.

4. There should be no premiums given nor trade-in allowances made in connection with the sale of any such appliance.

5. The presenting to the public of those electric appliances not having received reasonable customer acceptance should be considered as promotional activities and not as merchandising activities.

6. Coordinated advertising of approved appliances should be developed by electric utility companies and local dealers, and the electric company should give all reasonable assistance to the dealer in advertising, displays, and sales assistance.

7. The deferred payment feature of merchandising activities should be on an economically sound basis."

This considered pronouncement helped stabilize merchandising procedures over the past decade and might well serve again in the Victory period in continuing friendly relationship with the local trades and the public.

The retailer, as the vital link in distribution, should be the concern of the manufacturer and wholesaler alike with the utility. It is significant that at a recent meeting of the Postwar Planning Committee of the National Electrical Wholesalers Association, the Research Manager of a leading national magazine urged the importance of a selective market and carefully chosen dealers rather than indiscriminate distribution. A Professor of Marketing, speaking on the same program, pointed to the vanishing group of "smaller" dealers. Two years more of the war emergency will serve as an acid test of the efficiency and credit stability of the dealer group. Those who weather the gale will merit strongest support of the utilities in the reconstruction period as well as at present. There can be no question of the cooperative help of the wholesalers in solving the problem of dealer survival.

Although the problem of appliance maintenance involving relationship with both dealer and public is the leading one for solution in the process of serving residential consumers at this time, there are rumors that critical materials may be released for building a given volume of replacement equipment — electric refrigerators, ranges, irons and washing machines. As the peak of war production is passed, can we not expect there may be a general pick-up in the production of former models of household electric equipment in advance of the Victory period. This is one rift in a clouded picture for which we see hope of better dealer days.

Present trends which will affect post-war distribution—Government in business; the reconversion period; new manufacturers and advance model products; changing income levels and shiftings in population; the mortality of many present dealers and the coming of members of the chain family; and the re-defining of utility dealer cooperation—all of these will have a direct bearing on residential loadbuilding in the Victory period.

These subjects require periodic evaluation in the light of month to month developments. The thinking of all industry is in a state of flux, but who among us will doubt that with unified commercial effort the aspirations of the utility and associated industry groups will be fulfilled.

Highlights of Tomorrow's Lighting

Two outstanding lighting engineers express their views on postwar trends in lighting.

Ward Harrison

Director of General Electric Lamp Department's Engineering Division, Nela Park.

Mr. Harrison's Views

A REAL MARKET for fluorescent lighting after the war will be the nearly two million stores in the U. S. A. These stores, according to many utility executives, are chiefly interested in fluorescent lighting. Incandescents, however, will still have considerable use for spot-lighting.

Chain stores alone, one survey shows, will spend a half billion dollars in the first year after the war for store modernization. That divides itself into $3,500 per store. Since good lighting has always stood high up on the list of things a store should have, a considerable part of this should be available for lighting improvements. Three objectives in the G. E. 3A store-lighting plan are: lighting for attraction, appraisal, and for atmosphere. Of interest to architects and manufacturers of store-front materials is the all-glass "visual storefront" which reveals the whole store from the street. To accomplish this, the "visual storefront" store will require a relatively great amount of light. Among other markets for greater amounts of fluorescent lighting will be the theater and the gas service station.

Only one third of American industry as a whole is well lighted today. That leaves two thirds of the industrial market (both large and small plants) yet to be lighted in accordance with present lighting practice.

Many types of hermetically sealed lamps are being used on military vehicles, as landing lamps for war planes, for signaling on the ground, in the air, and at sea. An exceedingly powerful lamp is being developed for searchlighting and other military applications too secret to be revealed here. With slight modifications, sealed-beam lamps should find good post-war applications in the farm and railroad lighting fields. New opportunities for improved lighting for outdoor sports and for better drying methods through infrared radiation are indicated as the result of other lamp types developed for war needs.

The peacetime demand for projection lamps should expand at a greatly accelerated "rate." The value of movies, as an educational medium used so extensively by the armed forces, has been definitely proved. We shall also doubtlessly see a wide peacetime application of the V-Mail idea for photographing and projecting of microfilm records. Application of this war-born technique would not only make for much more effective and compact business filing but would facilitate a wider dissemination of educational material.

Duration developments in the photoflash field has led to material increases in peak lumens of five G. E. Mazda Photoflash lamps. War needs have also brought about the perfection of an uncanny photo device permitting flashes of enormously high candlepower, each flash lasting for only a few millionths of a second. Obviously, the peacetime applications of this super lighting "machine gun," equipped with a mercury vapor light source, holds great potentialities for the commercial, portrait and news photo fields.

One day, the public will hear specifically of the role being played by germicidal lamps in barracks, hospitals, submarines and elsewhere in the war effort. This lamp, I believe, will have a big future. Its importance in school rooms of the country probably will be second only to the use of germicidal lamps in the nation's hospitals. There will be

S. G. Hibben

Director of Applied Lighting, Westinghouse Lamp Division, Bloomfield, New Jersey.

a germicidal fixture and lamp business equivalent to at least one fifth that of relighting all of the country's schools.

Just as the use of germicidal lamps have been used by sugar refineries to sterilize a special sugar for canning—and at one tenth the former cost—and by meat packers to improve sanitary conditions of meat storage places, so will these germicidal lamps more than likely find countless practical uses in other branches of the foods industry.

Millions of men and women war workers, aware of the advantages of 25 to 50 footcandles levels from the fluorescent systems in their war plants, will not continue to be satisfied with the relatively low levels of lighting in their homes. It is not beyond the bounds of reason to presume that five to ten million fluorescent lamps alone for kitchen fixtures will be sold in the first year after the war ends.

More safety and lighting conscious than ever before many municipalities have already made detailed plans and are setting aside funds for post-war improved street lighting. Development of better street and highway lighting units is underway. It is not too early for utilities to be urging proper authorities to map plans for post war street lighting programs and to take an active part in these activities at the earliest moment.

"Millions of workers aware of the advantages of 25 to 50 footcandles levels from the lighting systems in their war plants will not be satisfied with the relatively low levels in their homes."

Mr. Hibben's Views

PLANNING the lighting for tomorrow's home is not merely to excite the imagination nor solely to develop idle curiosity. Maintenance of employment and of production demands a readiness to make and sell postwar devices certainly no later than the immediate cessation of hostilities and in many cases even before that.

Home making and modernization may rather be an easement over a considerable period of transition rather than some abrupt change like falling off a business precipice or being elevated into some seventh heaven of futuristic weirdness. We can profitably plan now—possibly use some plans before the termination of the war, or at least test out our plans before we need to put them into practice. A laboratory model of a refrigerator or washer may have to run a couple of years in development test before anyone can feel sure that the customer can get the fullest value from it. Sometimes a new lamp must burn more than a year before its life and characteristics are known. Thus planning now is not a bit too early.

Old equipment has not shown overly much imagination. Perhaps the incentive of wartime materials and radically new devices for the battlefield will incite some different types of construction or at least widen the field for different materials — glass, plastics, ply-wood and new metals.

New Homes Will Be a Big Market

Tomorrow's home lighting will probably begin with new equipment for the estimated one million new $6,000 class homes per year. If a rewiring scheme can be worked out without too much expense for the 50 per cent of our present residences that are more than 50 years old, then the modernization of at least half of our present homes would be the next step. Remember that half of our homes were wired before there were any electric refrigerators, ranges, washing machines, vacuum cleaners, or airconditioners.

The tendency seems to be toward in-built or architectural lighting equipment and away from exposed bare lamp bulbs, this being made easier by the fluorescent lamp. Fluorescent incidentally, are satisfactory today for work places in the home and after the war the resumption of production on softer colors more complimentary to the complexion will likely extend the fluorescent lamp into almost every part of the home, including curved shapes for floor portables, or baby sizes for luminous faced clocks, the telephone, the stairways, house numbers and all manner of ornaments. Miniature fluorescent lamps now classified as "war babies" such as used in the cockpits of bombers, special signals and markers will add to the variety for tomorrow's home services.

We may expect tomorrow's lighting levels to be raised because the citizen who has worked in the war factory under 50 footcandles of light will scarcely be content at home in the evening under 5 footcandles. Moreover when the industrial worker discovers that more than half of the employes, old and young, have defective vision, he will see to it that one of the large contributory factors to bad eyesight, namely bad home-lighting, is remedied.

Emphasis On Convenience

Lighting in tomorrow's home should be more flexible than today. This means a plurality of switches and circuits to give different intensities and different colors in many rooms, thus effecting what has been termed

mood conditioning. Pictures on the wall may become luminous panels; television; ultra-violet duplication of sunlight; or invisible radiant heat for bodily comfort will all be parts of the lighting system.

The heat lamp or infra-red drying lamp will probably graduate from the factory where it is now used to build airplanes and tanks, into the home where it will become a supplemental or spot-heater. Such heat lamps may be employed above the bed, flush with the floor, or built into a portable footstool for local comfort.

The Sterilamp is indicative of another home lighting adjunct because its peculiar kind of ultra-violet will reduce infectious diseases, help preserve foods, control odors, sterilize surface wounds and in general tend to make life longer as well as sweeter.

The cost of home lighting is probably not a consequential factor because the average residential lighting bill in the city is about $34 annually, while in the country the farmer with more appliances pays about $40 annually. Actually for about 10 cents per day, we get home electric service (including appliances) that is about the equivalent of having a horse work hard for about four hours each day. Most housewives in this servantless period know that it is no fun to work like a horse and there will be no difficulty in selling the idea of comfort-making and time-saving devices in tomorrow's homes.

Tomorrow's home lighting ought not to develop much if any higher lighting bill than today. If we do as well as we know how to do right now we could get about twice as much light for the same cost through the following means:

(1) Larger sizes of copper wire which in many cases is overloaded and is soaking up 5 to 10 per cent of the electricity uselessly.

(2) Keep lamp bulbs, lamp shades, reflectors, and accessories really clean.

(3) Think about the absorption of light in dark colors of paint and dark interior decorations.

(4) Throw away the old blackened lamp bulbs which really have degenerated into electric heaters.

(5) Buy and use only well established brands of bulbs, remembering that before Pearl Harbor there were among others some 10,000,000 Japanese made lamps of inferior quality that were sold in this Country under some camouflage name.

(6) Reduce the cost of lamp bulb renewals and enjoy gain in lamp efficiencies by replacing several smaller lamps wherever possible with one large one.

(7) Buy and use lamps made and marked at the voltage which the electric light company supplies your home.

We need more lighting imagination and good wiring not so many more lighting tools. The copper cobweb wiring standards of the Gay Nineties should no longer be acceptable if we think in terms of doubling the electric consumption every ten years. The lighting specialist today has nearly 5000 different kinds and types of tungsten filament lamps to choose from and tomorrow's lighting fixtures need no longer be limited to miniature suns imprisoned in glass bottles supported by imitation candles or writhing arms of brass, or small bathtubs hung from the ceiling by dog chains or reflectors that serve little purpose other than catching dead flies and falling dust. We know how to make America a gloriously electrified nation of homes, so it is not too soon to make up our minds that we are going to do it.

Cooperative Plan Announced For Appliance Conservation

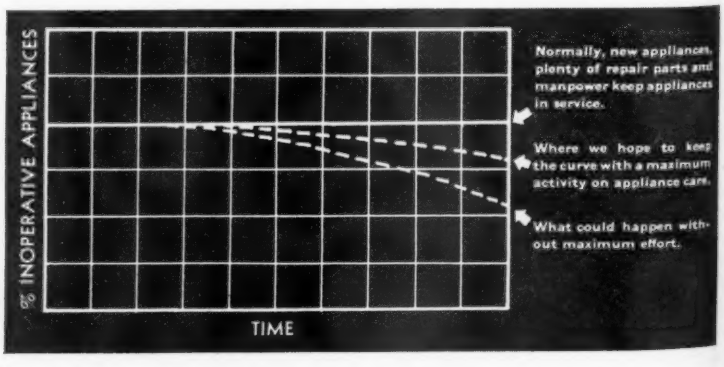
STARTING January, 1944, the electrical industry is launching the "National Appliance Conservation Program" which is designed to keep the estimated 200 million electrical appliances functioning during the war period. This is a cooperative program sponsored by the Edison Electric Institute and motivated in cooperation with electrical manufacturers, wholesalers, dealers, and utilities.

Many utilities are doing an excellent local job in acquainting their customers, through advertising, displays, demonstrations, personal calls, etc., with the need for appliance conservation. Many manufacturers, wholesalers, and dealers, through their advertising, distribution of appliance care booklets, etc., are contributing greatly. But the problem is a national one—and a National Program will add emphasis to the activity in those localities that are already doing a good job. Of even greater importance, it will stimulate activity in many localities which are not as yet adequately organized.

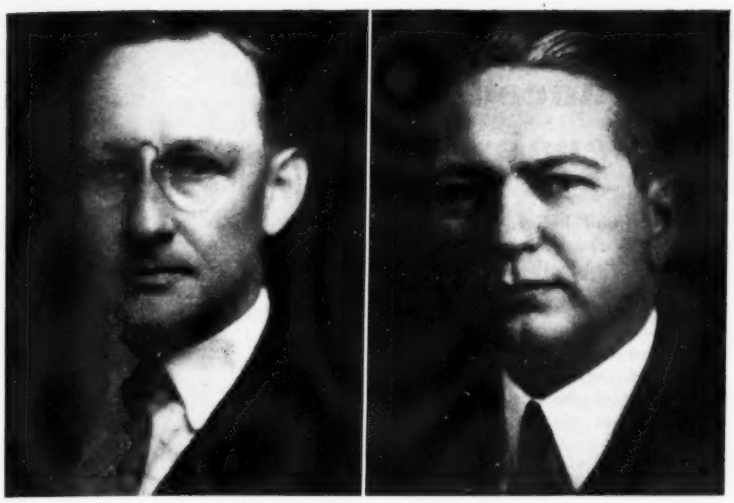
The program is intended to help the millions of housewives take better care of their appliances, they will be saving the critical materials that would otherwise be necessary for appliance repairs. They will be aiding the government efforts to conserve essential services and to fight waste.

Viewed Favorably By WPB

Both J. A. Krug, of the Office of War Utilities, and Arthur D. Whiteside, of the Office of Civil-


% INOPERATIVE APPLIANCES
TIME
Normally, new appliances, plenty of repair parts and manpower keep appliances in service.
Where we hope to keep the curve with a maximum activity on appliance care.
What could happen without maximum effort.

The objective of the industry's cooperative appliance conservation program is indicated by the middle curve in the above chart.



These two southern and southwestern utility executives are members of the advisory committee of the National Appliance Conservation Program. Left, Chas. A. Collier, vice president, Georgia Power Company, Atlanta, and right, Ted B. Ferguson, vice president, Texas Power and Light Company, of Dallas, Texas.

ian Requirements, have reviewed the program and commented as follows:

"The Better Care—Less Repair campaign ties in with our desire that all users of appliances will maintain them so that they may last longer and be available for use by those whose help is needed in the prosecution of the war.—J. A. Krug, director, Office of War Utilities.

"It was with a great deal of interest that I reviewed the program Better Care—Less Repair which I understand is a national cooperative program. My associates and I believe this a worthwhile effort on the part of the electrical industry, and we in the Office of Civilian Requirements will do our best to provide the critical materials to keep essential lighting and electric equipment operating during the war emergency."—Arthur D. Whiteside, vice chairman, Office of Civilian Requirements.

This activity is directed through utility channels out to retailers and consumers. It will augment the present programs of all branches of the industry. The plan includes simple but effective promotion material for the utilities and dealer's display floors, but the whole plan revolves around a practical and useful appliance Calendar Check List. On the front of the check list is a twelve-month calendar. Lifting the front sheet of the calendar check list, one finds a complete "Do's and Don'ts" list for essential appliances, telling the many things that the housewife *can do* to maintain her appliances and impressing a word of caution on the things that she should *not do* in order to assure longer life. It is expected that the Calendar Check-List will be distributed by the utilities through their Home Service Departments at civic club meetings, Parent-Teacher Association groups, church associations and by mail and personal contact. Also, dealers will be urged to have a supply to give to their customers.

Appliance manufacturers will carry in their national advertising the slogan "Better Care—Less Repair" and a brief statement of the program. It will also be "plugged" over the manufacturer's national radio hook-ups, and it is expected that the utilities will tie-in national copy in their local newspaper advertising. Dealers who advertise will likewise be urged to carry reference to Better Care—Less Repair.

M. R. Rodger, chairman of the EEI Committee in charge of the program, states:

"It is estimated that millions of electrical appliances save an average of 300 million housewives' hours every week. Many of these hours saved are devoted to Red Cross, U. S. O., Service Men's Centers, the selling of war bonds, stamps, and numerous other war services.

"In addition to emphasizing the better care of appliances, another important feature is the redistribution of appliances. It is urged that utilities and dealers organize the swap or trade-in plans in an endeavor to locate idle appliances and make them available for persons who need them. There are several plans now being promoted by utilities and dealers. We hope to see an expansion of this particular phase of the Conservation effort."

This Better Care—Less Repair Program dovetails with those of the Government for "Conservation," "Fight Waste," and "Food Fights For Freedom." Numerous organizations will be enlisted by the utilities to assist in spreading the message.

The National Appliance Conservation Committee has set January, 1944, for the kick-off month, and will carry on the program for the duration of the war. A plan book just issued outlines the part the utility can play in furthering the program and lists tie-in material which is available at cost. A four-page folder for dealers will be widely distributed. Included in a display kit are 23 pennants and window streamers with three different messages for display in utility-dealer stores. The complete kit containing these 26 items together with a four-page folder and the Calendar Check-List, packaged and ready for mailing, costs only seventy cents.

This snappy slogan and seal will be used to identify program activities.

New Procedure Announced for Obtaining Wire for Repairs

PROCEDURES under which persons engaged in the business of making repairs may obtain controlled materials and other materials and parts have been established in a new CMP Regulation No. 9A, the Office of Civilian Requirements announced on November 26, 1943. At the same time, an amendment to CMP Regulation No. 9, governing retailers' acquisitions of copper wire, was announced.

The new CMP Regulation No. 9A permits persons operating farm machinery repair shops, blacksmith shops, radio repair shops, upholstery repair shops, and electricians, plumbers, and others engaged in any type of repair work, to buy up to 20 tons of carbon and alloy steel, a total of 500 pounds of copper and copper base alloy brass mill and foundry products, and 200 pounds of aluminum in specified forms and shapes in any calendar quarter.

Special provision is made in the regulation to permit refrigeration repairmen, electricians, domestic appliance repairmen, electrical contractors, and radio repairmen to buy $150 worth of copper wire or one-eighth of what they used during 1941 (figured as accurately as possible by dollar volume), whichever is more.

The regulation permits repairmen to buy as much other material as they need for maintenance and repair work.

The amendment to CMP Regulation No. 9, eliminates from that regulation provisions under which repairmen were formerly able to obtain copper wire, inasmuch as repairmen will now obtain wire under CMP Regulation No. 9A.

To buy materials and parts under CMP Regulation No. 9A, a repairman must put a certification in substantially the following form on his orders:

CMP Allotment symbol V-3: Preference Rating AA-3:

"The undersigned purchaser certifies, subject to the penalties of Section 35 (A) of the United States Criminal Code, to the seller and to the War Production Board, that, to the best of his knowledge and belief, the undersigned is authorized under applicable War Production Board regulations or orders to place this delivery order, to receive the items ordered for the purpose for which ordered, and to use any preference rating or allotment number or symbol which the undersigned has placed on this order."

Repairmen who do work for persons who have the right to use an AA-2x or higher preference rating to buy non-controlled materials and parts for their own maintenance and repair, may use their customers' ratings to buy what they need for repair or maintenance work or to replace inventory used for such purposes.

Industrial Repair Provisions

Special provisions are made in Regulation No. 9A for repairmen whose work is primarily of an industrial nature. WPB may authorize such repairmen to buy up to 2,000 pounds of copper wire and a total of 2,000 pounds of copper and copper base alloy brass mill and foundry products. They may also be authorized by WPB to use an AA-2 preference rating. Applications for such authority should be addressed by repairmen engaged principally in industrial repairs to War Production Board, Reference CMP Regulation 9A, Washington (25), D. C. Application must be by letter and must (1) show what kind of work the repairman is doing and (2) what kind of customers he has.

If a repairman, industrial or other, requires more controlled materials in a quarter than he may get under Regulation No. 9A, he should fill out and send to WPB in Washington, a Form CMP 4B. WPB may then allot additional controlled materials and assign him a preference rating. However, if a repairman gets an allotment, he may not use the provisions of CMP Regulation No. 9A to purchase controlled materials, non-controlled materials or parts.

The regulation specifically prohibits repairmen from fabricating repair parts that they intend to sell to others, rather than use themselves, with the materials that they obtain under the procedures it establishes.

Deliveries of materials may not be accepted if the inventory of the repairman accepting such deliveries would become in excess of a 60-day supply, except in the case of copper wire, with respect to which the inventory limitation is 15 days.

Attention is called to the fact that materials obtained under CMP regulation may not be used in violation of other regulations and orders of WPB, and that in any case where special application is required to obtain certain materials such applications must be filed in order to obtain them.

Despite the fact that the new regulation makes provisions for repairmen to obtain copper wire, the War Production Board calls their attention to the fact that certain types of wire will not be immediately available, inasmuch as military requirements for them still absorb the major portion of the supply. For example, some kinds of stranded wire may be difficult to obtain for awhile because of war needs. However, certain types will be immediately available and the procedure to obtain such types is now outlined in the new regulation.

Changes in CMP Regulation No. 9, include the following:

(1) Elimination of provisions permitting repairmen to obtain copper wire, since they now operate under CMP Regulation No. 9A.

(2) Reduction of amount of copper wire which retailers may obtain to $50 worth per quarter or one-sixteenth of the amount sold during 1941.

(3) Provision that retailers may fill farmers' order for copper wire upon receipt of a copper wire allotment certificate.

The new CMP Regulation 9A is as follows:

Part 3175—Regulations Applicable To the Controlled Materials Plan (CMP Reg. 9A)

Parts and Materials for Repairmen

§ 3175.9a CMP Regulation 9A—(a) What repairman can buy materials and parts under this regulation. Anyone in the business of making repairs may buy materials and parts under this regulation. This includes such persons as farm ma-

(Continued on page 60)

Unsatisfactory Refrigeration Symptons, Causes and Repair

MANY complaints received by refrigeration service men come under the classification "machine runs but refrigeration is unsatisfactory." This kind of complaint requires considerable ingenuity on the part of the service man; specially, since the customer does not generally believe that truble of this nature is as serious as when the machine will not run at all and expects the service man to locate the trouble and repair it in a short time.

Frequently, complaints of this nature arise from a lack of understanding of variations in the frosting and in the performance of a machine resulting from changes in weather or load conditions, and from a lack of understanding of differences in frosting and performance between various models.

"Unsatisfactory refrigeration" complaints can be divided into two general classes: (1) evaporator does not frost properly, and (2) evaporator frosts properly but user is not satisfied with some part of the refrigeration service that the machine is supposed to render.

In complaints of the first class, improper, incomplete or erratic frosting of an evaporator may be caused by certain ambient or operating conditions, by an inoperative control, or by some fault within the machine. The location of the frost, if any, in combination with the noise from the machine and temperatures of the various parts, gives an indication of the source of trouble. In checking a machine for unsatisfactory refrigeration, the service man should make certain that it has run for a period of time sufficient to bring normal conditions if it were operating properly.

Complaints of the second type, where the frost on the evaporator is all right but some part of the refrigerator service is unsatisfactory, may include any of the following: cabinet temperature is too high: cabinet temperature is too low; unsatisfactory ice freezing; unsatisfactory dessert freezing or storing; sweating of evaporator door or interior of cabinet; high per cent running time; or high power consumption.

In order to give a complete but simple story on unsatisfactory refrigeration complaints, the accompanying tables of symptoms, causes and adjustments were prepared by the Edison General Electric Appliance Company, Inc. Although this material was prepared specifically for Hotpoint Scotch Yoke type sealed refrigerating machines, including the CE, CF, CJ, and CH machines, much of it will be found to apply in a general way to other refrigerating machines of similar type.

Unsatisfactory Refrigeration Symptoms, Causes and Adjustments

Evaporator Frost	Machine Operation	Noise	Temperature Relative to Hand (While Running)			Other Symptoms	Cause	Adjustment
			Dome	Condenser	Float			
(1) None	Runs Continuously	Light Metallic Clicking from Compressor.	Slightly Warm	Slightly Cool	Cool	Purges liquid (Purging screw should not be opened over ¼ turn.) A Flatop machine may not purge liquid until the base of the condenser is warmed.	Float stuck closed	Break loose with magnetic lifter or by tapping (not hammering) on the float valve shell. If it does not free itself, heat the float to drive out the liquid, and try again. Flush by lifting the bulb with the lifter several times.
(2) None (LK-1A Machines only)	Runs Continuously.	Light metallic clicking from compressor.	Slightly Warm	Slightly Cool	Slightly Cool	Purges frothy oil.	Oil logging of float valve. Original opening was near bottom of intake muffler. Oil in base would foam under conditions where liquid refrigerant would collect in base.	Keep lifting the float with magnetic lifter, (Do not leave current on lifter too long) until oil passes through to evaporator. The oil can also be purged out.
(3) None	Runs continuously.	Light metallic clicking from compressor.	Slightly Warm	Slightly Cool	Slightly Cool	Purges dry gas. (Purging screw should not be opened over ¼ turn.) If there is no refrigerant left in the machine, there will be little outward pressure when the purging screw is opened.	No or very low refrigerant charge.	Lift the float with magnetic lifter. It will come up easily. If there is some refrigerant, the series part of the evaporator will start to cool and even frost, but it will soon warm up. Check carefully for a leak.
(4)* None	Runs Continuously	Light metallic clicking from compressor	Slightly Warm	Slightly Cool	Slightly Cool	Purges dry gas. (Purging screw should not be opened over ¼ turn). Very little SO² odor if bled slowly through oil.	Non-condensable gas (air).	Bleed off the non-condensable gas slowly through oil. Check carefully for evidence of a low side leak.
(5)* None	Runs Continuously	Loud sputtering noise from compressor	Warm	Slightly Cool	Slightly Cool		Unloader stuck so that intake valve is held open.	Heavy jarring of the machine may break the unloader loose.

Unsatisfactory Refrigeration Symptoms, Causes and Adjustments (Continued)

Evaporator Frost	Machine Operation	Noise	Temperature Relative to Hand (While Running)			Other Symptoms	Cause	Adjustment
			Dome	Condenser	Float			
(6)* None	Runs continuously	Quiet. No oil flow can be detected against the compressor case dome. The compressor will coast to a stop Without the usual unloading noise.	Slightly Cool	Slightly Cool	Slightly Cool	If the machine is shut off for a while, or if the evaporator is heated, the evaporator may frost at first when the machine is started up.	Low oil	Machine must be replaced.
(7)* None	Runs continuously	Slight sputtering liquid noise from compressor or. No oil flow can be detected against the compressor case dome.	Slightly Cool	Slightly Cool	Slightly Cool	The compressor will coast to a stop without the usual unloading noise.	Oil passage to unloader is blocked.	Machine must be replaced.
(8) None, but the evaporator may cool some and possibly sweat.	Runs continuously	Loud sputtering noise from compressor. Hiss from compressor directly after shut off.	Very Warm	Slightly cool or slightly warm.	Slightly cool or slightly warm.		Bad discharge valve leak.	Shut off machine. Heat evaporator until it is warm. Restart machine. The warm and higher density refrigerant may flush out whatever is under the discharge valve.
(9)* None, but the evaporator may cool some and possibly sweat.	Runs continuously	Hiss from compressor while running and after shut off.	Very Warm	Slightly cool or slightly warm.	Slightly cool or slightly warm.		Internal high pressure leak.	Machine must be replaced.
10)* None, but the evaporator may cool some and possibly sweat.	Runs continuously.	Compressor quiet (Normal). Loud flushing noise from evaporator. Hiss from float orifice while running and after shut off.	Very Warm	Warm	Warm		Float stuck open	Break loose with magnetic lifter or by tapping (not hammering) on float shell. Operate it several times with the liftet.
(11)* None, but the evaporator may cool some and possibly sweat.	Runs continuously	Loud liquid boiling in compressor case.	Cool	Warm	Warm		Heavy overcharge of refrigerant.	Purge off the excess refrigerant, taking precautions so that it will do no harm.
(12) None on left side and bottom normal on right side and shelf.	Runs continuously	Quiet (Normal)	Warm	Slightly cool or slightly warm	Slightly cool or slightly warm		Low refrigerant charge.	Check carefully for a leak.

Evaporator Frost	Machine Operation	Noise	Temperature Relative to Hand (While Running)			Other Symptoms	Cause	Adjustment
			Dome	Condenser	Float			
13) None on shelf or right side; normal on left side and bottom.	Cycles Normally	Quiet (Normal)	Warm (Normal)	Slightly warm (normal)	Slightly warm (normal)	The shelf temperature remains constant above 32°, the bottom limits are normal.	Accumulation of slightly thickened oil in injector header	Shut off the machine. Heat the evaporator with the heater below injector header (lower right corner) until the right side is as hot as the hand can stand. Recommend regular hot water defrosting.
(14) None on shelf, little or none on right side; normal on left side and bottom except low on header.	Cycles Normally	Quiet (Normal)	Warm (Normal)	Slightly warm (Normal)	Slightly warm (Normal)	The shelf temperature limits are normal, drops of water will freese on it, and it will frost if the cabinet door is left open a while.	During periods of low outside humidity and under light load conditions, the frost migrates to coldest part of evaporator.	The machine is all right.
(15) Low or none on header; one or more of channels across bottom and part way up left side bare.	Cycles Normally	Quiet (Normal)	Warm (Normal)	Slightly warm (Normal)	Slightly warm (Normal)		Slightly low refrigerant charge.	The machine is all right unless the running time is excessive, or more than two or three channels are bare. Check for a leak.
(16) Normal while running; header defrosts rapidly when shut off.	Cycles with short "off" and and long "on" period.	Quiet (Normal). Hiss from compressor after shut off.	Warmer than normal.	Warmer than normal.	Warmer than normal.		Medium discharge valve leak.	Refer to Item 8, "Bad discharge valve leak."
(17) Normal while running; header, upper part of left side and shelf defrosts during "off" cycle	Cycles with long "on" period and long "off" period.	Quiet (Normal)	Warmer than normal	Warmer than normal.	Warmer than normal.		Partially weak bellows.	Change control or replace bellows. It is impossible to check a partially weak bellows except by turning the knob to "defrost" and noting that the control does not trip "on" even though the evaporator temperature goes above 60 F.

Evaporator Frost	Machine Operation	Noise	Temperature Relative to Hand (While Running)			Other Symptoms	Cause	Adjustment
			Dome	Condenser	Float			
(18) Normal in normal room temperature. Left side defrosted in cool room or when control at warmest positions. (CF-22C machines with Cat. No. M1A-235 Constant Cold Control).	Cycles Normally	Quiet (Normal)	Warm (Normal)	Slightly warm (Normal)	Slightly warm (Normal)	Poor ice freezing in cold room temperature.	Constant Cold Control designed to hold constant cabinet temperature with varying room temperatures. In doing this the evaporator temperature rises as the room gets colder. Defrosting must take place if cabinet temperature is to stay constant as room gets colder.	This machine and its control are all right. Operate control at position 8 or higher. Explain operation to user so he understands protection provided against a freezing cabinet in a cold room.
(19) Normal while running; completely defrosts during "off" cycle. (CE22G machines only).	Cycles withlong "on" period and long "off" period.	Quiet (Normal)	Warmer than normal	Warmer than normal	Warmer than normal		Control Knob is at too warm a position.	Turn knob to a colder position. For most installations position 8 (average) is satisfactory. The defrost spring (Cat. No. M15A87) under the knob can be replaced if it is necessary to run the knob at positions 2 and 4.
(20) Normal while running; header defrosts slightly when shut off.	Cycles with higher than normal per cent running time; shorter than normal "off" period and longer than normal "on" period.	Quiet (normal). Slight hiss from compressor directly after shut off.	Slightly warmer than normal.	Slightly warmer than normal.	Slightly warmer than normal.		Slight discharge valve leak.	Refer to Item 8, "Bad discharge valve leak."
(21)* Normal while running; shelf and right side defrosts rapidly when shut off.	Cycles with short "off" period and long "on" period.	Compressor quiet (normal). More than normal flushing noise from evaporator. Hiss from float orifice when running or after shut off.	Warmer than normal.	Warmer than normal.	Warmer than normal.		Leak around float needle.	Refer to Item 10, "Float Stuck Open."
(22) Normal except that suction tube frosts to enameled top plate. The suction tube may defrost during the "off" cycle.	Cycles with longer than normal "on" and "off" periods.	Quiet (normal) or slight liquid boiling in compressor case.	Warmer than normal.	Warmer than normal.	Warmer than normal.		Medium overcharge of refrigerant	Refer to Item 11 "Heavy overcharge of refrigerant."

*Items with asterisks are extremely rare.

Minimum Critical Material Used in War-Worker Homes

By Geo. H. Watson

ELECTRIC service was stripped to the barest essentials in a group of some 40 houses for war workers recently completed at Anniston, Ala. The Mable Electric Company of Anniston was the electrical contractor and the general contractor was the T. C. King Co., well known prefabricator of houses of that city.

The saving on critical materials extended throughout the construction of the houses and included not only electrical equipment but plumbing, heating, hardware and other metal ware. As an example shower cabinets, made of an enameled fibre board, were used in place of bathtubs, and coal heaters instead of central heating plants.

J. A. Mable, the electrical contractor, who has wired some 100 defense houses in the past year or more, said that 7½ pounds of copper wire, including 20 feet of service cable, was allocated to each of the five-room houses. Some houses took slightly more than this amount, others less, depending somewhat on the elevation and location, but he ended up with a small surplus of material. Bare neutral wire was used to save some material.

The service was brought to a flush entrance switch, placed in one of the closets. It has provision for four circuits, but only two were energized. All fixtures are of the pull chain type except the front porch lamp which has the only wall switch in the house. There are seven base plugs per house and six overhead lights, all of the same design, also a bracket light in the bathroom.

Mr. Mable said that after getting the job started and systematized, one house could be wired in about twelve hours. He and one other electrician stayed on the job until finished as it was a rush job. He added that he used some of the materials out of stock with the knowledge that he could replace them with the priority granted the project.

"While we departed from the usually accepted standard of modern lighting in equipping these houses, it must be remembered that the occupants will be much better off than they were in trailers, tourist camps and other crowded centers," said Mr. Mable. "As a matter of fact they can live comfortably in very attractive surroundings. The houses are structurally sound and more modern equipment in the way of lighting can be added later if desired."

Mr. Mable took on the housing projects more or less by request as his specialty is repairs and maintenance. He is the electrical

repair man for about a half dozen big industrial plants in Anniston, and he takes pride in the statement that not one of them has been down more than 70 minutes on account of electrical trouble since the war began.

Unit Relocation Solves Machine Lighting Problem

By Howard L. Plahn

THE RELIGHTING installation in the W. K. M. Valve Co. plant of Houston, Texas, serves well to show the need for professional light advice.

When Mr. Downs, plant superintendent at W. K. M., and tops in his line, was approached on the subject of adequate lighting for his machine tools, he stated that he had thought about it himself and had decided to install an additional row of incandescent fixtures down the center aisle. Thus providing three rows of fixtures in his long, narrow shop.

The lighting services of the Houston Lighting & Power Co. were offered and accepted. We checked his old system with a footcandle meter and found the average machinist had only four to six footcandles of light, plus badly located fixtures causing shadows and glare. These fixtures were spaced about twenty feet apart and in two rows, one row over each row of machines.

The idea of a third row of fixtures down the aisle was rejected on the grounds that no machine work was done there, that the light loss would be too great in trying to light the machines from the aisle, and that if the machines themselves were properly lighted the spilled light would provide adequate aisle illumination. We then supplied a layout calling for relocating about half of the present R.L.M. Dome fixtures and adding enough new ones to provide two fixtures mounted ten feet high over each machine, giving about thirty footcandles of well-diffused light.

Relocation of RLM lighting fixtures improved illumination in the W.K.M. Valve Co., of Houston, Texas, to approximately thirty footcandles.

The old fixtures included two 400-watt combination mercury and incandescent units which, due to the building's low wooden girder construction, were mounted so low as to cause direct glare and a concentrated pool of light. These were moved to another building of the plant where they are giving their rated performance at a higher mounting.

The submitted recommendations included alternative layouts for fluorescent (2/100-watt tube fixtures) and R.L.M. incandescent. The cost comparison, including first cost, maintenance, and energy cost, showed that at the end of two years both systems would be even. The high first cost of fluorescent would then have been offset by its lower operating cost.

Mr. Downs chose the incandescent installation and is very well pleased with it, claiming that whereas the night shift could formerly do only rough turning work, they can now do as fine work as the day shift.

J. A. Mable (right), of Mable Electric Company, Anniston, Alabama.

Industrial Electrical Work Keeps Contractors Busy

By S. W. Woolford

WITH WAR WORK tapering off, the electrical contractors of San Antonio, Texas, almost to a man, are turning once again to private work, commercial, industrial or residential.

Despite the slackening of government contracts, which was keenly felt throughout the industry, most contractors maintain a strong optimistic feeling. This is based in part on the belief that with the gradual collapse of Germany, the War Production Board will release more materials. Another reason for this optimism is the certainty that because of its natural resources, San Antonio and the surrounding area will witness a boom period immediately following the end of the war.

Foremost local exponent of this school of thought is A. C. Loyd, of the Loyd Electric Company. This company is a partnership owned jointly by Loyd and A. Braunschweig. One of the larger electrical contractors, this company specializes in designing and installing industrial equipment. After losing a fortune during the depths of the depression, they fought their way back to outstanding leadership in the field. Now, according to Mr. Loyd, the firm employs an average of 40 men and does an annual business of $200,000.

"Just before the war started," confided Mr. Loyd, a slender, wiry man with a shock of grey hair, "we used good foresight and laid in ample supplies of wire and various electrical equipment, so that when shortages and priorities came along we did not suffer as much as so many of our competitors here.

"Now that government work is almost nonexistent, we are confining ourselves to industrial work. In between jobs, we call in our men to work on repairs, just to keep them on the payroll."

The reason for their continued success, Mr. Loyd states, is their strict adherence to the age-old principles of good salesmanship.

"Don't forget," he declared, "many contractors, with fat government contracts in their laps, completely ignored the private customers they did work for during peacetime. Many of these individuals harbor a spirit of resentment yet, not because their jobs were refused, but because they were ignored. That's bad public relations work. To us, the customer still is, and always will be, right. Contrary to most contractors I know, we spend a great deal of time creating good will. And, believe me, it certainly pays dividends. Very often, instead of losing a job because of lack of certain materials, we have been able to persuade the customer to accept substitutes."

Returning to the topic of post war plans, Mr. Loyd believes there will be a changeover period, when all industrial work will be at a standstill, while plans are being drawn for concerns to swing into new enterprises. During this changeover, he stated, Loyd's will exert every effort toward getting private repair work.

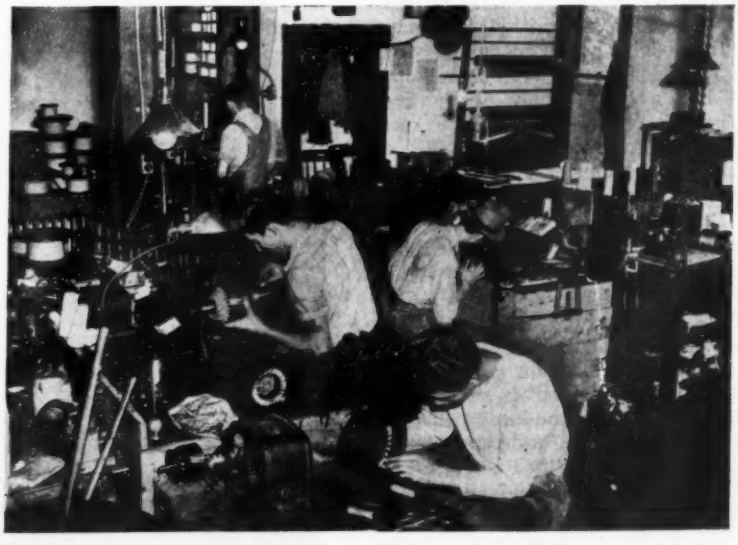
"We anticipate a boom in private residence wiring immediately following the war, and so we'll specialize in that field until industry opens up again," he concluded.

While the larger firms in San Antonio are devoting themselves entirely to industrial work, the smaller contractors, stymied for lack of materials and difficulty in obtaining priorities, have really had to scratch to keep going. Here's how one contractor solved his problem: The Krause Electric Company, after enjoying several very profitable years doing government work, suddenly found themselves in danger of having to close their doors because of a decided slump at the beginning of this year.

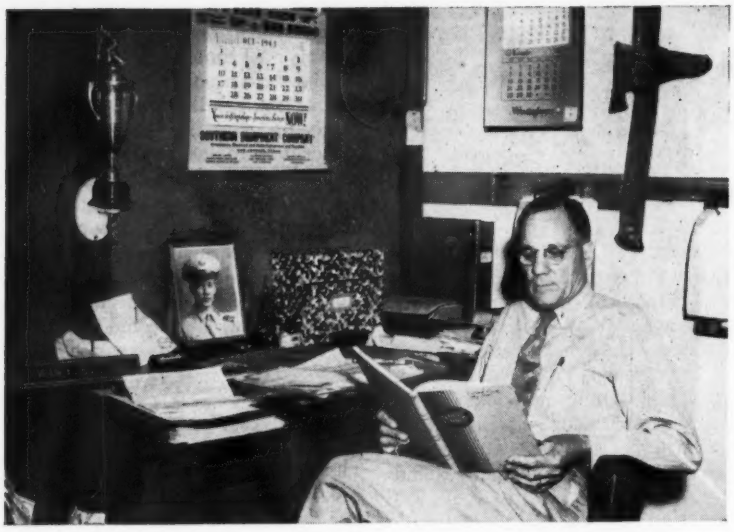
1943 Business Up 25%

"Last year," says owner Erwin Krause, "our gross was $60,000. This year we expect to raise that to $75,000. How did we do it? Well, our work is divided into two parts now. Fifty per cent still consists of regular war jobs at Kelly Field, while the other fifty per cent is composed of commercial and industrial work. You see, I employ five full time electricians and no helpers, and it became necessary for me to really act lively, if I wanted to keep them going."

"Acting lively" to Mr. Krause meant really getting out and getting the jobs. When, for instance, he heard that a local company was planning to build a dairy to cost approximately $35,000, he was right on the spot with his bid for the electrical work—and he got the job. In another instance, it was a packing plant. And in still another, it was a radio station.



Loyd Electric Company's motor repair department business is now an important part of this San Antonio firm's total business.



Erwin Krause, of Krause Electric Company, San Antonio, not only has successfully overcome the wartime problems that have beset the electrical industry but has increased the gross business of his firm some 25% over last year's business.

"For the post war period, I've got my eye on several jobs that I know will be started just as soon as the war ends. There's a man I know who is planning to enlarge his bowling alley. A builder in town is planning an addition as soon as priorities permit. Also, I'm sure that residence wire will be in great demand after the war. Yep, you've got to hustle," he said in conclusion, "if you want to keep forging ahead."

Another contractor, Nathan Alterman, of the Alterman Electric Company, has turned to lighting fixtures now that war work is over.

"Of course," admitted Alterman, "these jobs hardly compare with government work, but I found that I had a good supply of lighting fixtures on hand, enough to keep us busy for some time. And too, there's the danger that these fixtures might be outmoded when the war is over. So I decided to concentrate on clearing my stock. I might add that we are able to find more than enough work to keep us going."

The general feeling of optimism is not confined to the general electrical contractor but is shared to a great extent by the local utility also. E. H. Kifer, assistant general manager of the City Public Service Board, is also the chairman of the local post war planning committee. The utility company was recently purchased by the city from the San Antonio Public Service Company. With an eye toward the future, one of the first acts of the new board was to effect the restoration of priority ratings by the War Production Board for a 20,000 kilowatt steam-power addition to the municipal plant, raising it to 120,000 kilowatts.

"To the best of my knowledge," said Mr. Kifer, "only approximately seven such extension plants have been authorized by the War Production Board throughout the southwest."

Started in 1941, work on the extension was halted in 1942, then resumed last month and, according to Mr. Kifer, will be completed the latter part of 1944, insuring adequate power generating facilities to the San Antonio area for the future.

"The beginning of the war found us geared with spare capacity," related Kifer, "but that was quickly absorbed when the population almost doubled and new industries came into being almost overnight.

"By installing a tight control, we were able to assure good customer service. For the post war period, we feel that many industries, having found that our utility rates compare favorably with those throughout the country, will decide to change over to peacetime enterprises and stay on."

Kifer expressed himself of the definite belief that the end of the war will usher in an unparalleled period of industrial expansion in the San Antonio area.

"We have a climate ideally suited for year round production, we're rich in natural resources, and last but far from least, San Antonio is the gateway to Mexico and also all the South American markets."

Replacing Door Gaskets

When replacing door gaskets on older model refrigerators, if you will put soapstone or talcum on the lips of the new door gasket, the gasket can be worked underneath the micarta with a screw driver without having to take out screw.

Another view of the Loyd Electric Company motor repair department.

War-Plant Work and Service This Contractor's Specialty

By Gene Smith

THE STARR Electric company, Greensboro, N. C. not only has survived the material and manpower shortages ensuing from the war; it has surmounted them and emerged more than 100 per cent ahead of its prewar days.

Raymond Starr and his younger brother, John Starr, are not quite sure how it happened. Perhaps they have a head for figures—perhaps the organization was born under two "lucky stars," but probably the road to profits was kept free of detours after December 7, 1941, by the ingenuity of two men who split their company into halves. The elder brother is now "Raymond Starr, Incorporated," and concentrates on defense and outlying contracts as a subcontractor, while The Starr Electric Company has maintained a status quo, and, under the guidance of John, keeps the old customers satisfied by repair and salvage work.

Before the war the Starr brothers were doing commercial, industrial and residential wiring, selling lighting fixtures and small appliances, and doing general repair work. When war clouds began hovering, they encountered the same difficulties as all their fellow electricians. Raymond Starr says he believed they would not be allowed to sell certain articles and consequently did no "hoarding," other than keeping their warehouses supplied. Those warehouses, containing wire, cables, conduits, and fittings, have since been depleted almost 50 per cent. Some substitutes have been utilized—plastic fixtures in place of those formerly made of brass or steel, and iron wire instead of copper wire for distribution systems in pole line work. These materials, used primarily for temporary construction, will probably be replaced after the war with standard materials.

Mr. Starr places a great deal of faith in the fact that postwar days will bring a great amount of "reversal" work—transforming war production organizations into civilian use, and believes this will constitute the largest part of his business in the days immediately after victory.

When asked about advertising and promotional campaigns, Mr. Starr said no efforts had been made on the part of the company because all work that could possibly be handled was forthcoming without it. His contacts for out-of-town construction are made through trade bulletins and journals and through the government approved list of electrical contractors.

Repair work is on a consistently upward slant. Almost everyone realizes that new appliances are almost impossible to obtain and are concentrating on keeping their on-hand equipment in working shape. Mr. Starr says "We have more requests to replace burned-out elements of irons, toasters and lighting fixtures than for anything else, and knowing that these requests come from people who will always compose the bulk of our local trade, we try to please them as far as possible. Of course we are allowed maintenance parts, but as far as new appliances are concerned, we have no more than anyone else in the business.

Customers Recognize Difficulties

"Customers are very cooperative. They seem to realize that their various personal plights cannot be attributed to us and they act accordingly. Because we always do our best to help them, they will always come back."

The display room reveals the usual shortage of toasters, cleaners and other articles the average American home has heretofore taken for granted. Mr. Starr deplores the empty spaces on the shelves, but expresses confidence that someday not too far away they will be full again.

While, of necessity, the sales of appliances and catering to residential and private industrial requests have taken a back seat for the duration, army, navy and other government contractors have achieved a great deal in joint operation. Under the leadership of Raymond Starr, the business has reached its fingers into almost every army, navy and marine base in North Carolina and adjoining states. He is granted priorities while supervising this work, so the procurement of materials is the least of his worries. His most frightening bugaboo is the slowness of delivery and shortage of manpower. He reports a "severe shortage" of linemen, and says they have to use almost anyone they can find. He works hard and continuously keeping these inexperienced employees within rigid requirements. Sometimes proffered contracts must be rejected because of this difficulty.

At the outbreak of war men doing residential and industrial wiring not directly connected with governmental activities were put on work benches and service

(*Continued on page 59*)

Wholesaler's Motor Shop Proves Wartime Asset

By Baron Creager

RAPID transfer of emphasis from one field of specialization to another may have been a difficult war-time hurdle for many electrical equipment dealers, but in the case of the Dodge Electric Supply & Service Company of Tulsa, Okla., it was blood plasma for a wounded business.

The Dodge Company made a swift transition from wholesaler to motor and generator winding and repair shop. Before the war the gross volume of business was divided, approximately 66 2/3 per cent being wholesale movement and 33 1/3 per cent motor and generator repair.

Now the circumstances are more than reversed. Motor and generator repair represent 90 per cent of the volume of business and, naturally, wholesale movement of equipment is only 10 per cent.

It was a transition forced upon the company by that combination of circumstances and priorities over which none in the business have control. It was a transition involving very definite problem pains, specifically in magnet wire and manpower, but as a result of unrelenting watchfulness the Dodge company has its problems under control, at least to the extent that the firm's financial health is unimpaired, and the shop floor is largely filled with jobs awaiting their turn.

"A step we made in the early days of priorities had as much to do with our changeover, perhaps, as any other factor," says J. W. Dodge, owner and manager.

"We disposed of a considerable portion of our wholesale stock without getting good priorities and, as consequence, we couldn't replace the depleted items. Perhaps we would have made the changeover anyhow, for wholesale supplies became more and more difficult to get. But we were at a disadvantage in the matter of wholesale supplies, while our position was more favorable in our motor repair department. We had a stock of magnet wire of most sizes and insulations—a stock that might be considered adequate for normal operations. But we soon discovered that this stock was entirely inadequate under rapidly changing conditions of war demand."

J. C. Skillman, Dodge purchasing agent, explains what can and often does happen to render a stock of magnet wire utterly inadequate.

"Oftentimes," says Mr. Skillman, "we get a big motor re-wind job that requires more wire than the WPB allows us to carry in our entire stock."

Magnet Wire Stock Plan

And although the bulk of Dodge re-wind volume is on motors of one to 25 horsepower, maintaining a stock of magnet wire became an acute problem, so Mr. Skillman applied stock control in a manner intended to cope with the inconsistencies of the emergency. This control permits the company to anticipate its needs 60 to 90 days in advance. That much foresight is necessary because experience has taught that the average delivery date is 60 days from the date of order.

"Each month," explains Mr. Skillman, "we get an accurate picture of our position from a list that shows amounts used and stocks on hand in the many sizes and insulation of magnet wire. This list is compiled from job records and shop inventory, and it is projected ten months back. In other words, we total our consumption of magnet wire for a period of ten months and divide the total by ten to get the average monthly turnover for the ten-months period. Then this average monthly turnover figure is used as a basis for figuring our magnet wire orders for the next 60 to 90 days.

"After some experimenting with this stock control scheme, we were able to simplify it considerably. We found it was wasted effort to keep tab on 60 to 75 sizes and insulations of wire, so we eliminated from the list those types in which there was not much volume of work and thus reduced our list to about 42 items."

Mr. Skillman admits that under prevailing conditions there is much guess work involved in his stock control method. He is guessing, for example, that the number and type of jobs coming in will require no more wire than did the average month over a period of ten months. He is guessing that he will get delivery of the wire he needs and he is praying that delivery will be made in at least 60 days. But this control, maintained on a day-to-day basis, does give the company infallible information as to stocks on hand. And a shortage in any size of wire can be anticipated before it is an actuality and orders for that wire placed for first delivery from the regular allottment. Furthermore, the company is in position to tell a customer definitely when to expect finished repairs.

Priority ratings on wire consumed have been jealously guarded, too. A good priority position has been maintained from the start, so that the flow of orders is as consistent as can be expected in these times. At the end of the third quarter on September 30, volume in motor and generator repair with respect to priorities was divided in this manner: AA1, 70 per cent; AA2, 10 per cent; AA5, 10 per cent; no priority, 9 per cent; AA3 and AA4, less than 1 per cent.

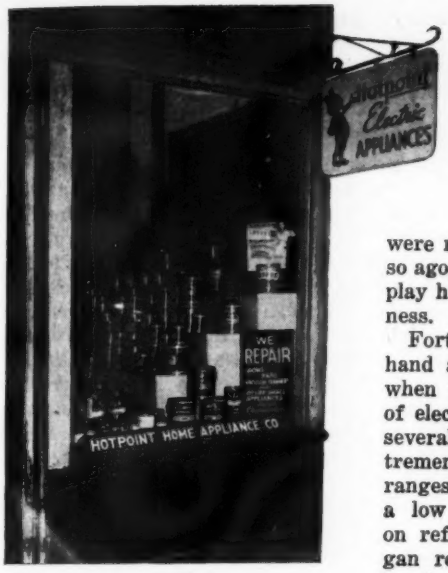
Small Motor Work Dropped

"We found it necessary," says Mr. Skillman, "to eliminate small household jobs and fractional motors. We don't accept such jobs any more.

"As a result of that step we discovered, somewhat to our surprise, that volume increased by one prodigious leap. In six months of this year, the records of one quarter over the preceding quarter showed an increase of 33 1/3 per cent in volume. That was because elimination of the small jobs made room for more big jobs. The labor cost of a big job is seldom more than the labor cost on a small job and there is a much more substantial profit on the big job."

When the Dodge company gets one of those jobs that requires more wire than it has in stock, they check the local trade to see if the wire is available. If it is not, they make telegraphic contact with their sources to determine which can supply the wire in the shortest period of time. Then the customer gets the facts of the situation and if

(Continued on page 24)



Although its display window is filled with paint and much non-electrical merchandise is shown on the display floor, this Birmingham dealer keeps its identity as an electrical appliance store and is optimistic about future appliance sales prospects.

Don't Lose Your Identity As Home Appliance Dealer

THERE is not a refrigerator, range, washer or radio on the floor at Hotpoint Home Appliance Company, in Birmingham, but the company is still "in business" principally because of the addition of related and substitute lines of merchandise and the building up of the service department. The co-proprietors, E. L. Chisenhall and Mrs. O. P. Moore, know now that their business will outlast the difficult wartime conditions. They were not so sure of that a year or so ago, when freeze orders began to play havoc with the appliance business.

Fortunately, this concern had on hand a heavy stock of appliances when the war came on. Its sale of electric ranges over a period of several months was little short of tremendous, often four to six ranges going out in one day. When a low ceiling price was slapped on refrigerators, this concern began renting the units it had on hand. It is still getting a nice income from these boxes and persons coming in to pay their monthly rent are prospects for other merchandise.

Other lines of merchandise added include ice refrigerators, kitchen cabinets (some were already carried), linoleum, paint, churns, coal heaters, and some furniture. As can be seen in the accompanying photograph, the concern has enough merchandise to present the appearance of a real home furnishings store, and it seems today that having the goods is the chief requisite to its sale. Some advertising has been done by the company, especially in the want ads, but most sales have been either through floor contacts or service connections.

Immediately after Pearl Harbor, an effort was made to build up the service department, and its reconditioning service on pressing irons as well as other small appliances has been really outstanding. As a shortage of irons developed in Birmingham and other defense areas, this concern began to advertise for discarded irons, offering to pay cash for them. Some of these needed only a little work to make them usable, perhaps a new element or handle. Others had to be completely rebuilt. All were given a new polish to make them look like new. At times this concern had on hand as many as 500 reconditioned irons and sold them far and wide, many orders being by mail.

Mr. Chisenhall said the supply of used irons was now getting low, as the field has been well worked. Also, a ceiling price on them has limited the profit to be made.

"It has been quite a checkered experience—this business of keeping an electric specialty shop during the past two years," said Mr. Chisenhall. "But every time it looked like we were completely stymied, some profit operation would open up. First, as merchandise in hand was unfrozen, we had a run on it as we had not ex-

At left is a view of the merchandise display floor of the Hotpoint Home Appliance Co., in Birmingham. Such items as kitchen cabinets, ice boxes, gas ranges and table appliances still give it an appearance of an electric appliance store. At right is the real "business end" of the business—the repair department—showing proprietors at work.

perienced before. Then we began renting refrigerators which brought us in a steady income. Then we did a big business in gas ranges, also in coal heaters prior to their rationing. Then the business in electric irons and other scarce items came along.

"In addition, we had good experience with several new items including paints and floor coverings. And we have sold dozens of electric churns at $39.95. It seems that as the milk and butter supply became scarce, and butter was rationed, more and more people decided to have their own cows. That necessitated churns, and it was our business to supply them. We plan also next season to add dehydrators, and possibly pressure cookers, if made available in sufficient volume to supply the need of Victory Gardeners."

Mr. Chisenhall said that operations under these difficult conditions had not been easy because of lack of help. He and Mrs. Moore have had to do their own selling and their own servicing, and even sweep the floors at times. But fortunately, they have been able to get enough merchandise to bridge the gap and of a kind that sells readily. Chisenhall said he had to work some at night in order to get out the service work, but he believes everybody ought to work harder to help win the war.

Fortunately, the concern retained the paper on the major appliances sold before the supply was exhausted. This floor traffic of customers paying their bills is now quite helpful in the sale of the substitute lines of merchandise. Mr. Chisenhall said he was looking forward with eagerness to the time he will again be able to sell new refrigerators, ranges, washers and radios, but he is not sure but what his concern will continue to handle many other items as well. They help to build floor traffic and that is what the specialty shop has needed in the past.

Wholesalers Motor Shop Proves Wartime Asset

(*Continued from page 22*)

his job is rush he is encouraged to inquire if he can get faster service elsewhere.

Shopping for wire by telegraph saved one customer about $45,000, Mr. Skillman relates. That was the case of an oil refinery with a 150 horsepower motor out of service. With the motor down, the refinery was out of operation and every day of operation lost meant several thousands of dollars. The Dodge company shopped around and got delivery of the necessary wire 15 days ahead of any competitor's promise.

In another instance, a coal mine was forced to close down because of motor failure and the mine management appealed to the Dodge company by long distance telephone. It was another case where the job required more wire than was in stock.

"We sent the shop foreman down there," said Mr. Skillman, "and he managed to salvage enough wire from coils to put the motor in service and the last we heard, it hadn't failed."

Like everyone else, the Dodge company has had its manpower troubles. In normal times, the shop alone gave employment to 12 or 15 men, but defense plants as far away as California have taken their toll and the shop force is down to a fluctuating seven, eight and nine men. Mr. Dodge would like to hire more men if he could get them—experienced men. Inexperienced men increase the costs per job, and constitute a general burden on the shop, for they require almost constant supervision in the beginning.

And while the number of men on the shop payroll has been halved, that payroll demands approximately as much in dollars and cents as it did before the war. But the balance is supplied by skyrocketing volume, a volume that has overcome per-unit shrinkage in profit margins as well as increasing payrolls.

"We are very happy since we quit the wholesale supply business and concentrated on motors and generators," said Mr. Dodge.

"I wouldn't say 'quit,' " interjected Mr. Skillman. "I would say we are dormant in that line of the business."

"That's right," agreed Mr. Dodge. "I don't know when we'll dispose of the balance of this wholesale stock. It has to be pushed and it is impossible to get competent men to do the pushing. The pushing in our business is now being done by customers who are desperate for motor repairs."

Huge Parts Stock Aids Washing Machine Service

THE electric washing machine is one home appliance that is functioning to keep up morale on the home front. This was emphasized by T. B. Pritchard, owner of the Pritchard Electric Co., of Oklahoma City, Okla. He supplies electric washing machine parts to dealers and service men in six states—Oklahoma, Texas, Kansas, Louisiana, Arkansas and New Mexico.

This firm does no repair work. It has a stock of 40,000 parts for washing machines covering nearly every make from the oldest to the newest models. Many of the parts are for washing machines more than 15 years old. Parts were even furnished by the firm for a 1905 model. A few electric and gasoline-powered machines were on the market even at that early date in the electric appliance industry, Mr. Pritchard said.

As in the electric refrigeration industry, the demand for parts has greatly increased in the washing machine appliance business since beginning of the war. Whereas, before Pearl Harbor, the Pritchard firm carried a stock of about 10,000 parts, it has multiplied this stock four-fold since then, in spite of priority difficulties.

"If I cannot find certain parts on the market, I go to the factory and have some made, if the manufacturer has no war production obligations at the time," said Mr. Pritchard.

Most difficult parts to obtain at present are those made out of brass, Mr. Pritchard explained. The former scarcity of parts made from zinc and aluminum is being somewhat relieved as such materials become more plentiful, he added.

Wartime conditions which have made it difficult for steam laundries in many communities to give prompt service, have forced more housewives to have their washing done at home. The old electric washing machine has been dusted off and is really enjoying its just share of appreciation again. More "Help Yourself" home laundries have sprung into being and the electric washing machines in these require new parts and servicing. The Pritchard firm is supplying parts for several of these in Oklahoma City and to service shops throughout its territory.

Basic Operating Principles Of Electrical Instruments

By G. F. Gardner*

Part 3.—Wattmeter Principles and Construction

LET US now take the ammeter shown in Fig. 14, of Part 1, and connect it in a circuit as shown in Fig 15, omitting the shunt and adding resistance in series with the moving element, instead. On alternating current, the deflection of the instrument pointer would depend on the product of the instantaneous current flowing in the fixed and moving coils. Since the current in the moving element is proportional to the line voltage, the instrument indication will be proportional to the product of the instantaneous voltage times the instantaneous line current. Or, in other words, the instrument will read watts, and the scale can be so marked.

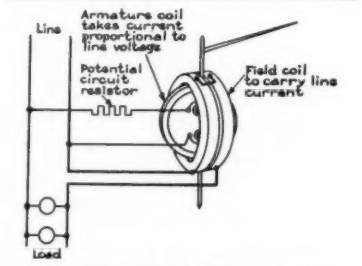


Fig. 15. Schematic view of a dynamometer element arranged to make a wattmeter

If the maximum and other corresponding values of current and voltage occur at the same instant, as shown in Fig. 16, that is, if the angle between them is zero, the load is said to have a power factor of unity, since cosine (cosine is the angle between current and voltage) is equal to 1. If the current lags 30 degrees behind the voltage, as shown in Fig. 17, the power factor is 0.866 lagging. Note how the instrument which we have shown in Fig. 15 will respond to this condition, remembering that it always reads the quantity proportional to the instantaneous product of the volts and amperes. To take a specific

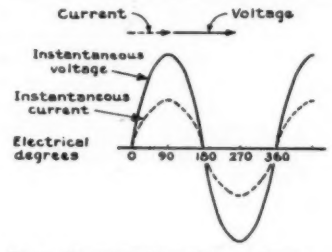


Fig. 16. Current and voltage relations in alternating-current circuit. Power factor equals 1.

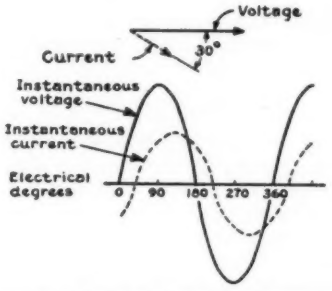


Fig. 17. Current and voltage relations in alternating-current circuit. Power factor equals 0.866, current lagging.

example: we will draw lines corresponding to the voltage and current, values e and i, at a given instant, t, as shown in Fig. 18, and take their product. This product (e x i in Fig 19) will be indicative of the torque on the moving element at that particular instant. Repeating this at suitable intervals, we obtain a torque curve which approximates that shown in Fig 19. Note that the torque is positive in direction at certain intervals during the cycle, and negative in others. The instrument pointer will, of course, assume a position dependent on the average value of the torque over a period of time, since the instrument element is not fast enough to respond to each impulse of a 60-cycle source. Had a power factor of unity been selected, the torque would have been positive in direction at each instant.

While we are pursuing this analysis, let us apply it to the voltmeter which would be connected across the same line—plotting the torque curve over one cycle. Since, in a voltmeter such as is indicated in Fig 12, the field and moving coils are connected in series, the instantaneous currents in each element are always in phase, regardless of the power factor of the line. To obtain the torque curve, we simply square the ordinates on the current curve. Because of the mass of the moving element, the instrument pointer will again assume an average position with respect to the double-frequency torque pulsations. These conditions and the procedure are indicated in Fig. 20 and 21.

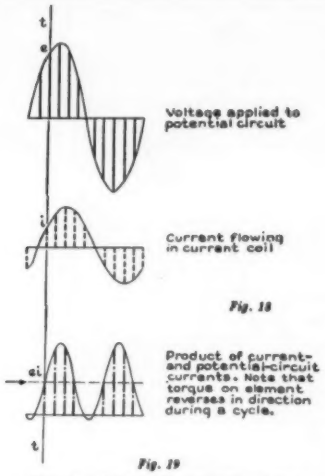

t
e
Voltage applied to potential circuit
i
Current flowing in current coil
ei
Product of current- and potential-circuit currents. Note that torque on element reverses in direction during a cycle.
t

Fig. 18

Fig. 19

Current, voltage, and power relations in a wattmeter

The dynamometer-ammeter element shown in Fig. 14 will also

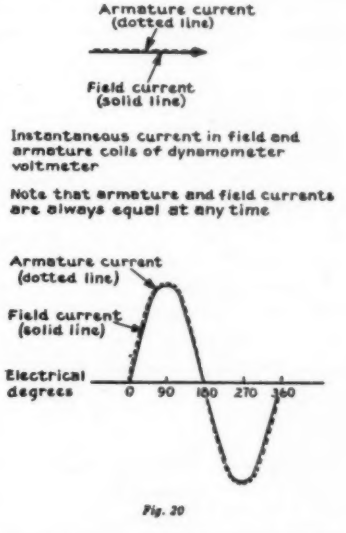


Fig. 20

*Mr. Gardner is associated with General Engineering Laboratory, General Electric Co., Schenectady, N. Y.

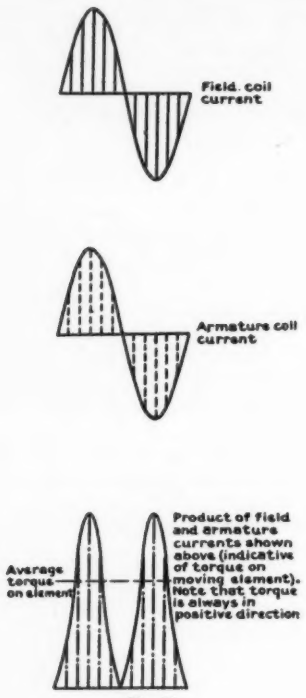

Field coil current
Armature coil current
Product of field and armature currents shown above (indicative of torque on moving element). Note that torque is always in positive direction
Average torque on element

Fig. 21

be subjected to the same continuous positive pulsating torque, since the current in the movable coil is always in phase with the line current which flows in the current coil.

In closing this brief discussion on the manner in which these instruments indicate circuit conditions, the reader should always remember:

The dynamometer-voltmeter indicates *root-mean-square* (rms) voltage.

The dynamometer-ammeter indicates *root-mean-square* (rms) current.

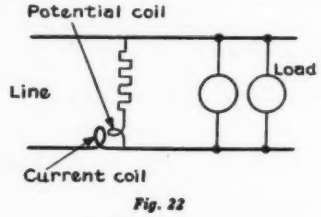


Fig. 22

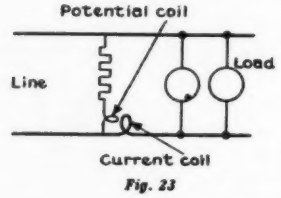


Fig. 23

The dynamometer-voltmeter indicates *average* power.

A wattmeter may be connected in circuit as shown in Fig. 22 or as in Fig. 23. Note that in one case the wattmeter potential-circuit loss is being measured; and in the other, the wattmeter current-coil loss. The potential-circuit loss of a typical portable 500-watt wattmeter, 5 amperes, 100 volts, would be in the order of 2 watts at 100 volts; hence, if this instrument were connected as shown in Fig. 22, the watt reading would be 2 watts higher than the true value of watts consumed in the load. The current coil for the wattmeter previously described requires about 2 watts at about 5 amperes. Since the voltage is usually fairly constant, while the current varies, it is much easier to correct the readings for a constant potential-circuit loss than for a varying current-coil loss. Thus, the connection including the potential-circuit loss is usually preferred.

Compensated Wattmeters

If we made a wattmeter having an auxiliary current winding (each wire of this auxiliary winding lying alongside each wire of the regular current-coil winding and having the same number of turns as the current-coil winding) but connected it in reverse direction and in series with the potential coil as shown in Fig. 24, we should have what is known as a compensating wattmeter. For an example of its principle of operation, consider the following. Connect this compensating wattmeter as shown in Fig. 25. Now the only current which flows through the current coil is that taken by the potential circuit, and this flows through the compensating winding as well. Since the two windings are opposite in direction, the field of the fixed coils is zero, and no deflection of the wattmeter pointer occurs. When we close the load switch, the instrument will indicate the correct value of watts, since it automatically subtracts the watts required by the potential circuit. It is obvious that compensating wattmeters must be carefully connected in the circuit according to the diagram furnished by the manufacturer.

Compensating wattmeters are often provided with an auxiliary compensating winding known as a voltmeter winding. This consists of an additional winding subtractive as before, so arranged as to be used with a special voltmeter which is located as shown in Fig. 26. When a voltmeter is inserted in the line at the points provided, the voltmeter current flows through its compensating winding and automatically subtracts the watts taken by the voltmeter. The voltmeter used for this class of work is usually especially calibrated for this service, since the compensating winding possesses some resistance. This must be considered when calibrating the voltmeter.

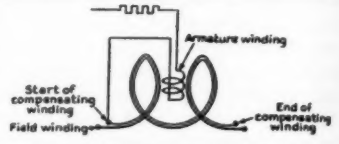


Fig. 24. Schematic arrangement of windings of compensating wattmeter

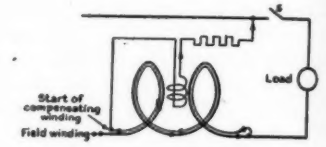


Fig. 25. Illustrating action of compensating wattmeter

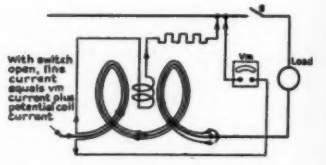


Fig. 26. Illustrating action of compensating wattmeter having voltmeter winding

So far in our study of instruments, we have considered only two classes—the permanent-magnet moving coil, and the dynamometer types. In recent years, the improvements in magnetic materials have made modification of the dynamometer type possible, resulting in better characteristics for many classes of work. For example, it has been found possible to add iron to the field structure of dynamometer instruments to change the coil geometry, and to utilize the general construction as shown in Fig. 27. This is called the electro-dynamic type, and has found considerable favor in small, compact instruments for general testing where intermediate accuracy is desired. The space necessary for an element having the desired torque is considerably smaller that that requir-

(*Continued on page 59*)

Southeastern Sales Executives Discuss Postwar Problems

NEARLY 150 sales executives of southeastern electric utility companies gathered in Atlanta, on October 28 and 29, to attend the general sales conference of the Southeastern Electric Exchange which featured a comprehensive program embracing both wartime problems and postwar plans. Hugh C. Isley, general sales manager of Carolina Power & Light Company, Raleigh, and chairman of the Sales Section of the Exchange, presided over the general conference.

"The National Conservation Program," was the subject of an address by William A. Lyons, chief, Fuel and Allocations ranch, Office of War Utilities. Mr. Lyons assured the utility executives that there was no intention to change from the voluntary plan of conservation of electric power. He pointed out that 1943 consumption of U. S. bituminous coal will be just over six hundred million tons, 10 million tons more than production, and that this shortage will have to be taken from stockpiles which by next January may reduce reserves to less than a 40-day supply.

Further fuel savings, Mr. Lyons said, must now come from civilian users. At one time, a mandatory order that would put out lights was entertained, and also, a ration plan for coal was considered. However, after consultation with the utility industry committee, a voluntary plan of conservation was adopted. The purpose of the program was to reduce to a minimum the unnecessary uses of fuel not governed by other conservation regulations.

Mr. Lyons said that a task committee met recently and arrived at the decision that the program could be expedited by further publicity. The committee expressed confident belief that if the recommended steps were taken, conservation goals could be achieved. Records indicate, concluded Mr. Lyons, that companies which have done the best job in the past in promoting service sales are now doing the best jobs in "demoting" service sales, and he cited Georgia Power Company as typical of such companies.

The opportunity for conservation is actually one to sell rather than to "unsell" if it is used to increase utility income in customer goodwill, said R. B. Roberts, Jr., general sales manager of Florida Power & Light Company, Miami, in an address entitled "Customer Good-Will Under Wartime Conditions." Past efforts to create good will have frequently overlooked fundamentals, Mr. Roberts said. Two viewpoints in every company must be taken into account: management executives must view operations from internal viewpoint while sales managers must view operation from viewpoint of customer service. He pointed out that if sales department personnel has internal operation viewpoint only, customer goodwill must depreciate.

Milestone In Public Relations

Mr. Roberts cited the national advertising of a group of operating companies as a fundamental change in the right direction and one which has played an important part in improving customer relations since 1940. The most important thing which companies can do at this time to improve customer relations, he said, is to give wholehearted, sincere cooperation to government in the war effort. More than lip service is needed!

New power load from new farm products was the subject of a talk by M. H. Bruner, agricultural consultant, E. I. DuPont de Neumours and Company, Clemson College, S. C. Mr. Bruner presented an interesting exhibit of manufactured products developed from agricultural products — principally cotton and wood. In a period of less than 20 years, he said, this country has reduced the number of strategic materials of foreign origin from 42 to 21. Many of these strategic materials are now made synthetically, utilizing agricultural products of the South.

More than a million houses will be needed annually for a period of ten years, following the war, said Irving W. Clark, manager, Better Homes Department, Westinghouse Electric & Mfg. Company, Pittsburgh, in discussing new construction after victory and its relationship to the utility industry. Need is one thing, Mr. Clark said, and converting that need into reality is an entirely different thing. In addition, he pointed out that there are thousands of homes that will need modernization urgently. He estimated that well planned public works and buildings will require the expenditure of approximately $1.00 to $1.50 for every dollar spent on housing.

Factors affecting this postwar building program are: expected large income, decreased indebtedness, and an estimated 42 billion dollars in savings. Combined with this is the fact that, according to recent surveys, a large percentage of all renters want to own their own homes. In addition, it is expected that the net increase in families was as much as 700,000 per year in the last few years.

Unfavorable factors would be lower income than expected; fear of unemployment; competition for consumer dollars by other products; possibility of inflation. Some factors are local and others are national in scope but all can be influenced by planning and logical action. He predicted that regardless of what forms the postwar home might take, it will be all-electric. Great quantities of power will be available, and rate trends are such that electric power will will be the lowest-cost home servant.

Prefabricated home manufacturers now have a capacity of 125,000 houses annually, Mr. Clark said. Merchant builders are expected to continue as an important factor in the building industry. There is also an indication that the postwar period will find large building contractors firmly entrenched in mass production of houses.

An interesting point stressed by Mr. Clark is the fact that 16 million women are employed in industry and are learning the use of labor saving devices. It is inconceivable, he said, that these women will not

(*Continued on page 57*)

AIEE Technical Meeting Features Wartime Operating Problems

MORE than 225 electrical engineers attended the American Institute of Electrical Engineers Southern District Technical Meeting, in Roanoke, Va., November 16, 17 and 18. The three-day meeting featured papers on wartime operations and the wartime development in the electrical industry.

The principal feature of the opening session was an address by Dr. N. E. Funk, president, AIEE, who declared that electrical advancements of the past generation have only scratched the surface of what shall yet be accomplished.

Dr. Funk referred to Radar, the almost miraculous electrical device which makes it possible to detect the presence of enemy airplanes flying so high they cannot be seen. He also mentioned television as an electrical development which almost everybody would have termed impossible a generation ago, and said that electrical communication will play a constantly increasing role in airplane guidance after the war. August P. Gompf, chairman of the meeting committee, presided over the opening session. Delegates were welcomed by the Honorable Leo S. Henebry, Mayor of Roanoke, and a response was made by C. W. Ricker, of Tulane University, Southern District vice-president, AIEE.

Capacitors Discussed

The afternoon session on wartime operation, over which Herman B. Wolf, Duke Power Company, presided, heard first a paper on "The Effect of Kilovar Supply on the Design of Systems for Load Growth," by T. W. Schroeder, J. W. Butler, and N. H. Meyers, all of General Electric Company. The authors pointed out that kilovar supply by capacitors or condensers, in many cases for a single purpose, such as voltage improvement, reduction in transformer, line or cable loading, may not be justified as other means may permit a lower first cost but that when these effects are viewed jointly, and evaluated on a system-wide basis, a different conclusion may result.

The conclusions of the authors indicated that the area within the system in which the use of capacitors begins to show an economic advantage depends very greatly on the character of the system being studied. Where the unit or small substation principle is applied, making the low voltage, heavily loaded circuit runs comparatively short, the gains are less in the distribution areas. This principle of distribution system design shifts the major benefits from the distribution to other parts of the system behind the substation areas.

"The 13,500-kva Static Capacitor Installation at Newport News," was the subject of a paper presented by E. L. Harder, Westinghouse Electric & Mfg. Company, and V. R. Parrack, Virginia Public Service Company.

To meet a predicted reactive load requirement of approximately 15,000 kilovars, a large capacitor bank was installed at Newport News. This paper outlines the considerations involved in selecting the static capacitor and determining its novel design features. The 10,500-volt capacitor bank was made up of low voltage outdoor pole-type units which could be used later in the distribution system. It was divided into five sections with manual switching for control of voltage.

Tests were made after installation to check the adequacy and operating characteristics of the installation with regard to regulation, inrush currents, voltages during switching, and effect on wave shape. The underlying theories of these phenomena are reviewed briefly in the paper to provide a background for interpretation of the various test results presented. Tables, curves and formulas are given for predicting inrush current magnitudes and frequencies and voltages encountered during switching.

In general, the tests verified the ability to predict the several performance characteristics and provided useful empirical data on regulation. Inrush currents and voltages during switching were well within the limits of proper application. Harmonics were not seriously increased. The positive results of these tests provide a satisfying benchmark on the road to larger capacitor installations in single banks.

The first afternoon session was concluded with a paper presented by M. A. Hyde, Jr., Westinghouse Electric & Mfg. Company, on "Capacitor Application in Pipe-Line Pumping Stations."

H. G. Rickover, U. S. Navy, was the guest speaker at an informal dinner meeting Tuesday meeting, over which J. H. Berry, Virginia Electric & Power Company, presided. Captain Rickover, who is head of the Navy's Electrical Section, discussed many of the electrical problems with which the Navy has been faced in this war. His comments were all "off the record."

Milton L. Levy, Higgins Industries, Inc., New Orleans, opened the Wednesday morning session on wartime development with a description of the growth of the Higgins plant.

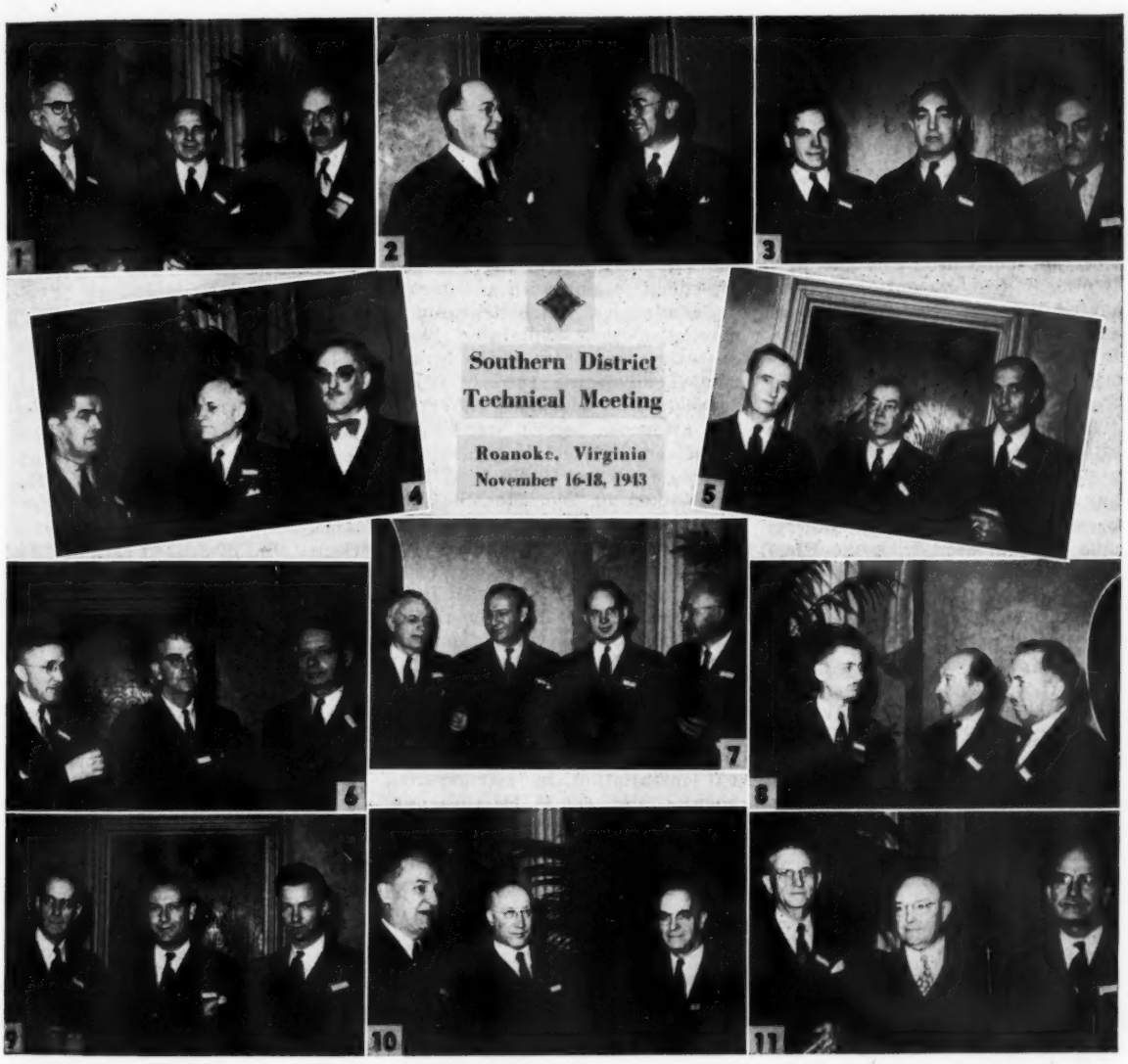
Gas-Filled Cable Described

"High - Voltage, Low - Pressure, Gas-Filled Cable" was the subject of a paper presented by W. A. Del Mar and A. F. Gambitta, of Phelps Dodge Copper Products Corp. The paper was followed by a motion picture showing details of such a cable installation at Norfolk presented by W. F. Nimmo, Virginia Electric & Power Company.

The low-pressure gas-filled cable installation at Norfolk is of particular interest because it is the most recent installation of this type and is the one operating at the highest voltage.

After the most careful thought had been given to all factors affecting installation and operation, the authors of this paper pointed out, the Virginia Electric & Power Company chose low-pressure gas-filled cable as the most satisfactory type of cable for the underground section of their new 38 kv feeder which was installed to meet the fast expanding load requirement in the Hampton Roads area of Norfolk.

W. S. Rodman, University of Virginia, brought the Wednesday



(1) C. W. Ricker, vice president, Southern District, AIEE, Tulane University, New Orleans, La.; August P. Gompf, chairman, general meeting committee, C & P Telephone Co., Richmond, Va.; E. S. Fitz, vice chairman, general meeting committee, Virginia Electric & Power Co., Richmond, Va. (2) Dr. N. E. Funk, president, AIEE, Philadelphia Electric Co., Philadelphia, Pa.; E. W. O'Brien, W. R. C. Smith Publishing Co., Atlanta, Ga. (3) H. H. Sheppard, Rumsey Electric Co., Philadelphia, Pa.; Harold C. Lang, Norfolk, Va.; J. H. Berry, Virginia Electric and Power Co., Norfolk, Va. (4) R. C. Bailey, Virginia Electric and Power Co., Richmond, Va.; Mark Eldridge, War Production Board, Washington, D. C.; V. R. Parrack, Virginia Public Service Co., Charlottesville, Va. (5) Geo. M. Tatum, Virginia Public Service Co., Charlottesville, Va.; C. L. Crosby, Allis-Chalmers Mfg. Co., Richmond, Va.; J. L. White, Appalachian Electric Power Co., Roanoke, Va. (6) Cecil Gray, Westinghouse Electric and Mfg. Co., Richmond, Va.; W. D. McCune and R. I. Butterworth, both of East Tennessee Light and Power Co., Bristol, Tenn. (7) Mark Eldridge, War Production Board, Washington, D. C.; J. S. Fossick, Memphis Light, Gas and Water Division, Memphis, Tenn.; Tomlinson Fort, Westinghouse Electric and Mfg. Co., East Pittsburgh, Pa.; C. R. Jones, vice president, Eastern District, AIEE, Westinghouse Electric and Mfg. Co., New York City, N. Y. (8) F. E. Johnson, secretary, Southern District, AIEE, New Orleans Public Service, Inc., New Orleans, La.; T. H. Mawson and F. H. Sittloh, both of Commonwealth and Southern Corp., Birmingham, Ala. (9) J. M. Olive, J. S. Fossick and James R. Morton, all of Memphis Light, Gas and Water Division, Memphis, Tenn. (10) J. W. Magee, Westinghouse Electric and Mfg. Co., Baltimore, Md.; E. T. Eberhardt, Subox, Inc., N. Arlington, N. J.; W. P. Cochran, Westinghouse Electric and Mfg. Co., Philadelphia, Pa. (11) J. G. Simpson, Westinghouse Electric and Mfg. Co.; J. Elmer Housley, Aluminum Co. of America, Alcoa, Tenn.; Leo F. Henebry, Mayor of Roanoke, Va.

morning session to a close with a discussion of the training program for future technicians. War needs are causing hundreds of thousands of Americans to obtain, through 250 universities and colleges, specialized training they otherwise probably never would have acquired, Dean Rodman said. He predicted that a large percentage of these students will return to college after the war to complete the technical training they began in uniform. It will not be surprising, he said, if the government appropriates money to give advanced training for a year or more to every returned service man who wants it. President Roosevelt recently said he would advocate a billion dollar appropriation for

(Continued on page 56)

Virginia Chapter, IAEI Holds 10th Annual Meeting

A COMPREHENSIVE program embracing both wartime electrical code problems and new electrical developments was presented at the two-day annual meeting of the Virginia Chapter, International Association of Electrical Inspectors, in Richmond, on November 9 and 10. More than 100 members and guests were in attendance.

The opening session featuring an address by the international president of IAEI, T. W. Bowry, who is associated with the Electrical Inspection Bureau of Richmond. At the same session Arthur L. Abbott, of the Engineering Department of National Electrical Manufacturers Assn., New York City, discussed the interim amendments to the National Electrical Code. The first morning session was concluded with an address by W. C. Bloomquist, General Electric Co., Schenectady, N. Y., on "Industrial Distribution Systems."

C. T. Pearce, of the Westinghouse Electric & Mfg. Company, Philadelphia, opened the Tuesday afternoon session with an address on electronics which featured a moving picture explaining basic operating principles of the fundamental electronic tubes. Other speakers who addressed the Tuesday afternoon session were E. G. Romeiser, Porcelain Insulated Wiring Systems, Union City, Ind., who talked on "Non-Metallic Wiring Systems"; A. A. Togesen, Bull Dog Electric Products Corp., Detroit, whose subject was "Flexible Electrical Systems"; H. I. Lamb, Electrical Equipment Co., Richmond, Va., who discussed "Motor Burnouts and Servicing"; G. M. Anderson, Richmond Engineering Co., Richmond Va., who described some of the moisture problems that complicate electrical installation in refrigeration rooms; and O. M. McCullough, production and inventory analyst, War Production Board, Richmond, whose subject was "W. P. B. Regulations as Related to Electrical Inspection."

O. V. Sessoms, of Virginia Electric & Power Co., Richmond, opened the Wednesday morning session with a discussion of care and repair of electrical appliances under wartime conditions. He was followed on the program by L. P. Spoon, Thomas & Betts Co., Elizabeth, N. J. who talked on "Pressure Connectors."

In addition, the Wednesday morning session included talks by N. E. Cannady, of North Carolina Insurance Department, Raleigh, who discussed some of the problems encountered in getting proper electrical inspection in smaller communities; O. K. Coleman, American Gas & Electric Service Corp., who discussed articles 210, 220 and 230 of the National Electrical Code; Howard H. Weber, manager of wire sales, U. S. Rubber Products Co., New York City, who discussed the probable trend in rubber-covered wire design after the war; Lee F. Adams, General Electric Co., Schenectady, whose subject was "Motors in War Time"; and James S. Mahan, Fustat Manufacturers Assn. Chicago, who discussed "Type S

(*Continued on page 55*)

(1) A. M. Miller, of Richmond, secretary of Virginia Chapter; M. G. Folkes, chief electrical inspector of Richmond, who was elected chairman of the Virginia Chapter for 1944; and J. L. Speights, Virginia Electric and Power Co., Richmond. (2) C. W. Bradley, chief electrical inspector of Norfolk and chairman of the Chapter, who presided over the tenth annual meeting. (3) C. S. Whitaker, city electrician, Durham, N. C.; E. G. Romeiser, of Porcelain Insulated Wiring Systems, Union City, Ind.; and H. H. Weber, Manager Wire Sales, U. S. Rubber Products, Inc., New York City. (4) Baxter McIntosh, Appalachian Electric Power Co., Lynchburg, Va.; O. K. Coleman, American Gas and Electric Service Corp., New York City; and Arthur L. Abbott, of NEMA, New York City. (5) George A. Sawin, of NEMA, New York City; and L. F. Adams, of General Electric Co., Schenectady, N. Y. (6) L. P. Spoon, Thomas and Betts, Inc., Elizabeth, N. J.; N. E. Cannady, N. C. State Insurance Dept., Raleigh, N. C.; and J. S. Goldback, Atlantic Electric Corp., Norfolk.

NEWS of the INDUSTRY
National and Southern

Construction Order L-41 Revised and Amended

A completely re-drafted Order L-41, which limits construction, has been issued in simplified form by the War Production Board. The new language of the order is intended to make the restrictions more easily understandable by the public.

Typical of the language of the revised order is its introduction, explaining the purpose of L-41: "This order limits construction. It is necessary in order to conserve materials, construction equipment, labor, and transportation. In most cases, except where the construction is of a special kind, you must get permission from the War Production Board for construction."

In addition to simplifying the regulations and instructions, the revised order makes the following substantive changes:

1. The limit on farm construction, including residential, is placed at $1,000. Previously, there were separate limits, farm residences not being considered part of the farm unit.

2. A limit of $200 is placed on any type of construction for which a higher specific limit is not authorized by the order. This overall limit formerly was $1,000.

3. The exception, originally made by L-41-b, for the insulating of buildings, has been liberalized in accordance with WPB policy relating to fuel oil conservation. On the other hand, the exception covering the conversion of heating equipment from oil to coal has been eliminated because of the tight coal situation.

4. Minor capital additions under CMP Reg. 5 in certain of the more essential industrial plants are excepted from the L-41 restrictions.

5. In calculating costs to determine if a job is within specified L-41 limits, the cost of used materials, or the value of labor furnished free, need no longer be included.

6. Cost limits now refer to the calendar year, instead of to any consecutive twelve months period.

7. Installation of plumbing equipment rated on WPB-2631 (formerly PD-851) is permitted if the cost is under $200.

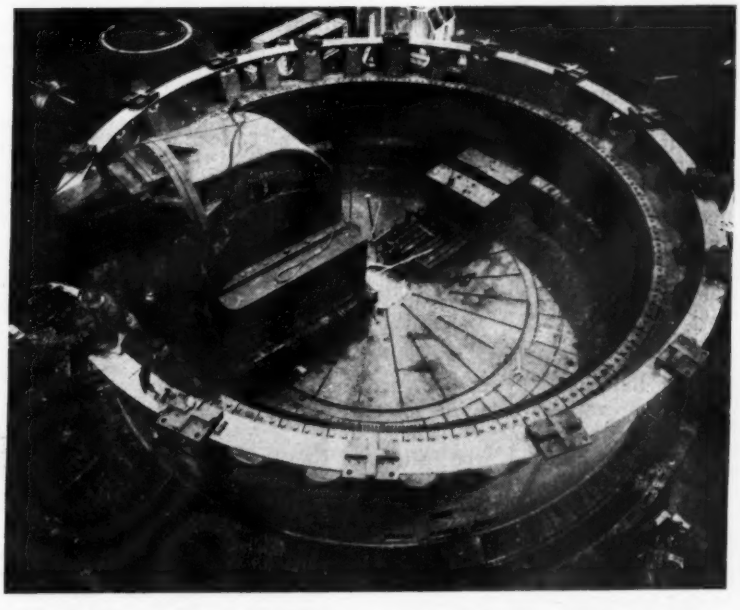
8. Schedule B, listing various kinds of construction relating to operations of farms, railroads, utilities, mines, etc. which may be begun without WPB permission, has been altered in several respects. Drilling of water wells, certain radio facilities, and timber access roads financed wholly or in part by defense highway appropriations have been added.

With issuance of the revised L-41, Orders L-41a, L-41b, L-41c, and Interpretation No. 1 are revoked inasmuch as their provisions are either incorporated into, or altered by, the new order.

NEMA Releases Results Of Public Opinion Survey

The electrical industry is rated by the public as giving people "the most for their money" and "having done most to raise the standard of living in America", according to a survey of public opinion undertaken recently by The Psychological Corporation and made public recently by the National Electrical Manufacturers Association. In the survey, opinion regarding the electrical industry was compared with opinion regarding three other major industries—aviation, chemical and automobile.

Covering a scientifically selected cross section of adult opinion, the survey places the aviation industry as the one that "will do the most for the American people in the future" and also as the one that "is doing most to help win the war".



BIRD'S-EYE VIEW OF WATERWHEEL GENERATOR FRAME—A huge waterwheel generator frame for Kentucky Dam, a Tennessee Valley Authority project near Paducah, Ky., is nearing completion at General Electric's Schenectady Works. The generator, nearly 37 feet in diameter, will be the second of several 32,000-kilowatt units ordered for the dam.

When asked which of the industries named "is most likely to keep up its employment after the war", the public listed the automobile industry first with aviation, electrical and chemical following in that order.

Delving into opinion about the electrical manufacturing industry only, subsequent questions in the survey revealed confidence of the public in advertised brands and a conviction that prices of electrical products had been going down (prior to the war) while quality was improving.

Sixty-one per cent of the adults questioned stated their belief that "you get more for your money when you buy from a manufacturer who advertises".

Answering a question as to whether the price of electrical products had been trending downward prior to the war, sixty-nine per cent replied in the affirmative and an even larger percentage, eighty-nine per cent, expressed the opinion that at the same time quality was improving.

By a ratio of two to one, those interviewed expressed the opinion that electrical products made "for use by other industries" are more important than the electrical products manufacturers make for use in the home. Yet those interviewed were able, on the average, to name only two products that are made for use by other industries.

A question relating to whether the public would get more or less for its dollar if the electrical manufacturing industry were run by the government instead of by the present management brought interesting results which were described by Dr. Henry Link, vice president of The Psychological Corporation as "indicative of opinion about private enterprise generally rather than of the electrical manufacturing industry as a separate entity".

Those interviewed were about equally divided as to whether government operation would give more or less for their money. Primary reason given by those who believe they would get more under government operation is that "government operates with no profit" and government would run it cheaper". Those holding the contrary view stated essentially that "government is inefficient, government doesn't know how" and that "government is extravagant".

Thirty-seven per cent of those interviewed held the opinion that there are monopolies in the electrical manufacturing business. Twenty-two per cent stated their belief to the contrary, while forty per cent had no opinion on the subject.

A majority of those questioned believed that the electrical manufacturing industry ought to tell the public more about itself through advertising and other means.

Ward Leonard President Elected President NEMA

Leonard Kebler, president, Ward Leonard Electric Co., Mount Vernon, N. Y., was elected president of the National Electrical Manufacturers Association at the annual meeting. He succeeds Max McGraw, president, McGraw Electric Co., Chicago, Illinois.

Mr. Kebler has been president of Ward Leonard Electric Co., since 1904. In 1917, he was associated with the Naval Consulting Board and the Bureau of Standards.

In October, 1937, Mr. Kebler was elected to the NEMA Board of Governors and has been a member of the Board continuously since that date. The following year he was elected treasurer of NEMA and held this office until October, 1942. He was also chairman of the NEMA Budget Committee from 1940 to 1942 and has been a member of the Officers Committee since April, 1939. In 1942, Mr. Kebler was elected a vice president of NEMA.

Leonard Kebler, right, president, Ward Leonard Electric Co., Mt. Vernon, N. Y., who was elected president of the National Electrical Manufacturers Association at its recent annual meeting in New York, receives the congratulations of his predecessor, Max McGraw, president, McGraw Electric Co., Chicago.

Five vice presidents elected at the annual meeting were:

V. R. Despard, vice president, Pass & Seymour, Inc., Syracuse, N. Y.; C. R. D'Olive, manager, household appliance division, Stewart-Warner Corp., Indianapolis, Ind.; C. W. Higbee, manager, wire and cable department, U. S. Rubber Co., New York, N. Y.; D. G. Phelps, vice president, Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., and A. C. Streamer, vice president, Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.

F. T. Wheeler, vice president, The Trumbull Electric Mfg. Co., Plainville, Conn., was re-elected treasurer.

North Carolina REA Group Withdraws from Association

The North Carolina Rural Electrification Superintendents Association, at its quarterly meeting at Durham, N. C., November 17-18, voted to withdraw from membership in the national association.

In announcing the decision, J. T. Hagans, of Tarboro, president of the association, said that the group had voted "to withdraw from the national association until national can show its work would be of greater benefit to the REA program in North Carolina."

It was stated that money paid in dues to the national association could, in the opinion of the North Carolina group, be used bettter for the benefit of the REA program in the state.

The association, upon the invitation of W. L. Patterson, manager of the Davidson County Electric Membership Corporation, selected Lexington, N. C., as the site for its next quarterly meeting February 18-19.

Considered at the Durham meeting were plans for the post-war extension of the rural electrification program in North Carolina, with Dave Barbour, REA engineer, and Walter P. Ward, regional operating engineer, both of Raleigh, leading the discussion.

Principal speaker at the meeting, which was concerned with operating problems, meters, transformers, etc., was A. H. Graham of Hillsboro, former lieutenant governor of North Carolina, who spoke on the topic, "Rural Electrification Association and its War-Time Job." Mr. Graham, who was one of the lead-

A quick picture of

FRIGIDAIRE'S WARTIME PROGRAM

and what it means to Frigidaire Dealers

Official O. W. I. photo

ARMS FOR VICTORY

Victory Is Our Business. Building weapons of war has been and continues to be our first and most important responsibility.

We take pride in the recognition we have received for the job being done in Frigidaire's four war production plants.

In the Army-Navy "E" Flag and star awarded to us for excellence, and the Army Air Force "A" rating we have received.

Today more men and women are employed in Frigidaire plants than ever before in our history. And our war production is still mounting.

Only when the whole story of Frigidaire's planning and production can be told will the full significance of the statement "Victory is our business" be apparent.

What This Means to Frigidaire Dealers

Wartime accomplishments have brought us new knowledge and skills that will benefit the Frigidaire dealer when we return to peacetime production, and surely Frigidaire's wartime record will enhance the value of the Frigidaire name.

KEEPING 'EM RUNNING

Victory Is Our Business on the home front, too. And keeping the millions of Frigidaire products operating efficiently is another important responsibility. For today the nation's food supply must be protected and conserved as never before.

We're proud of the dependable way in which Frigidaire household appliances and commercial equipment are serving their users.

Proud, too, of the Frigidaire dealers and service men who are guarding this record of dependability during these trying times.

We are constantly helping this service organization in every way we can. By supplying vital parts; by providing training aids; and by holding frequent factory and district-conducted schools to help dealers train service men.

What This Means to Frigidaire Dealers

Frigidaire service today is building a backlog of customer satisfaction and good will that will mean increased sales for Frigidaire Dealers after the war. Right now, this service business is helping Frigidaire dealers maintain income during a critical period.

HELPING THE USER

Victory Is Our Business. The proper use and care of the nation's 20 million household refrigerators is vitally important to the war effort on the home front.

Frigidaire accepted the responsibility of providing needed wartime information . . . not only to Frigidaire users, *but to every owner of a refrigerator.*

Month after month Frigidaire's advertising messages in leading magazines have told housewives how to make their refrigerators serve better and last longer.

Similar help has been given in Frigidaire's 36-page WARTIME SUGGESTIONS booklet. More than six and a half million copies have been distributed . . . *most of them by Frigidaire Dealers.*

Home economists, group leaders and other organizations were given helpful information for their use. Hundreds of users, home economists, dealers and others have sent us unsolicited letters endorsing the program's aims and purpose.

What This Means to Frigidaire Dealers

This comprehensive program is keeping the name Frigidaire before the public in a way that will be favorably remembered. And it is also helping Frigidaire dealers maintain identification with Frigidaire and build good will for themselves in their communities.

PLANNING FOR THE FUTURE

Victory Is Our Business so we have little time for future planning. But, every moment we can spare without interfering in any way with war work is devoted to this important subject.

Every Frigidaire dealer, large or small, has been given an opportunity to express his views and desires on every phase of our post war business. These views and opinions are being carefully considered and will play an important part in the planning of our peacetime selling activities.

What This Means to Frigidaire Dealers

After Victory there will be more and better Frigidaire products for more people. Frigidaire dealers will have the right merchandise, the right selling tools and every support they need to keep on top. Frigidaire's 25-year record of leadership is a blueprint of the future.

For Excellence

ARMY E NAVY

in War Production

Listen to GENERAL MOTORS SYMPHONY OF THE AIR; Every Sunday Afternoon, NBC Network

FRIGIDAIRE Division of GENERAL MOTORS

Peacetime Builders of HOME APPLIANCES · COMMERCIAL REFRIGERATION · AIR CONDITIONERS

ing proponents of the rural electrification program while a member of the North Carolina Legislature, told the superintendents that "of all the Government agencies inaugurated in the past 10 years, rural electrification comes nearest to 100 per cent public approval. Personnel of REA are achieving more on the home front than they could do in actual combat. By no means could the present amount of farm goods be produced without the help of rural electrification."

Radio Tube Distribution Plan Gets Consideration

Plans whereby the present and future output of non-military radio receiving tubes would be made available from manufacturers to distributors on an equitable basis and thus receive wider distribution among owners of household radio sets for maintenance and repair were discussed by the Electronics Distributors Industry Advisory Committee meeting in Washington recently. A plan proposed by Frank H. McIntosh, chief of the Domestic and Foreign Radio Branch of the Radio and Radar Division, War Production Board, who was Government Presiding Officer at the meeting, was recommended by the committee.

Under this plan, each of the half dozen manufacturers first would offer for sale to the other manufacturers a certain minimum percentage of each type of tube he manufactures, in order that all manufacturers would have a supply of all types of tubes. The manufacturers then would offer to the electronics distributors with whom they deal a supply of tubes based on a percentage of the amount of tubes by type which the distributors purchased in 1941. In this way, the distributors would have a more balanced stock with which to supply their dealers who attempt to keep the public's radio sets functioning.

TRACKING DOWN VIBRATIONS —A new vibrograph, developed by Westinghouse Research Laboratories, measures and records machinery vibrations in the range from 60 to 15,000 cycles per minute. Enclosed in a small box, and weighing only 8½ pounds, it can be used by placing it on the vibrating body, or hand-held through the use of a prod.

TRYING A WALKIE-TALKIE — E. H. McCarthy, manager, sales division, Gamewell Company, talks over new type Signal Corps field telephone used by combat troops in war areas. Howard H. Weber, sales manager, wire and cable department, United States Rubber Company, is holding the extremely lightweight wire used with these telephones by men in farthest outposts to report observations. This two-conductor wire, weighing less than 30 pounds per mile, was developed for the Signal Corps by United States Rubber Company.

No Additional Supply

The plan would not necessarily bring about any additional supply of radio tubes for civilians, Mr. McIntosh emphasized, but would result in a more balanced distribution based on distributors' business in 1941. Some manufacturers have been following this practice voluntarily, but others have been filling orders for tubes on the basis of precedence of orders, members of the Electronics Distributors Industry committee said.

The program would leave the distributors the decision on how their stocks were to be pro-rated among dealers in order that the public would be best served.

Civilian Needs Surveyed By Government Agency

Census enumerators will soon start knocking at the doors of 7,000 American households to obtain a scientific sampling of civilian shortages in 115 types of goods and services.

This census of shortages, announced by Arthur D. Whiteside, vice chairman of the War Production Board, signalizes a swinging into action of the Office of Civilian Requirements which has been quietly making a series f "spot check" surveys in specific areas and on specific products in preparation for the country-wide analysis.

When the results of the survey have been tallied, OCR hopes to have answers to these questions, Mr. Whiteside said:

1. To what extent are shortages and other consumer problems causing actual hardship?
2. What products now in short supply are most needed by the civilian population, and is the lack of any specific item so seriously affecting health and morale as to interfere with the productive efficiency of war workers, farmers and other civilians?
3. Is the available supply of consumer goods being distributed fairly?
4. What is the quantity of durable goods such as electric irons and washing machines now in the hands of consumers and what condition are they in?

PRECISION TESTING — Checking current transformers with a Leeds & Northrup Silsbee Test Set. One of the industrial photographs in the Leeds & Northrup exhibit — "Precision Measurements & Automatic Controls in America's War Industry"—featured at the Franklin Institute, Philadelphia, during October and November.

MITCHELL

TODAY'S FINEST FLUORESCENT FIXTURES FOR *Industrial* AND *Commercial* LIGHTING

Again and again, MITCHELL has come through with the right answer for each new lighting need. The two units shown above are typical. Their advanced design provides many practical advantages. They are light in weight and comply with WPB regulations.

MITCHELITE—First all-purpose "lightweight" fluorescent fixture for wartime industry! Provides for every method of mounting or hanging. 3 models: 2 and 3-light units using 40-watt lamps; 2-light unit using 100-watt lamps. *Fleur-O-Lier Approved.*

MITCHELL U.R.C. RESEARCH LUMINAIRE—Combines the ultimate in high intensity with low surface brightness (glare). Pendant or surface mounting. Uses four 40-watt lamps. Takes less time to install than any other commercial fixture. Less than 6 lbs. of metal. Available now at the same original low price.

Get Free Catalogs from your MITCHELL Distributor or write to:

MITCHELL FLUORESCENT

MITCHELL *Manufacturing Company*

2525 CLYBOURN AVENUE • CHICAGO 14, ILLINOIS

1230 Sixth Avenue • Rockefeller Center • New York 20, N. Y.

UNITED STATES

Miles from nowhere —but the message gets through

He'd crawled, run, crawled again. Now he was far ahead of his company... into enemy territory... surrounded... cut off completely from American forces except for a strand of lightweight wire... Laytex Assault Wire.

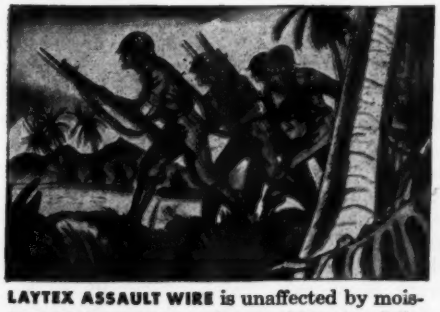
But his messages got through surely and clearly... made possible a successful advance.

Laytex Assault Wire is made expressly for jobs like this. It's extremely lightweight... yet tough enough to be used by advance scouts.

The use of such lightweight small diameter wire is possible only because the insulation is of such high quality—has high resistance to moisture, withstands a wide range of temperature changes and does not become embrittled when subjected to vibration and shock. Laytex Assault Wire has a talking distance of over five miles.

LIGHTWEIGHT Laytex Assault Wire weighs only thirty pounds per mile. This means that an advance scout can carry ample wire while pushing ahead.

SPECIALLY DEVELOPED for front line service, Laytex Assault Wire is hard at work in Europe, Asia, the South Pacific.



LAYTEX ASSAULT WIRE is unaffected by moisture or temperature changes because of the high quality of the insulation. This means it can be laid and used successfully regardless of climate or terrain.

FIVE MILES LONG—but messages get through clearly. Laytex Assault Wire, tested and retested for quality, has a proven talking distance of more than five miles.

RUBBER COMPANY

Fixtures Not Available For Commercial Use

The Fluorescent Lighting Fixture Industry Advisory Committee met on November 9, 1943, to discuss the relationship between the "Critical Construction Materials Design Guide" and the "Army Navy Munitions Board Prohibited List," fixture weight limits and compliance problems in connection with them, ideas for revision of Order L-78, control of fixture sales under CMP Regulation No. 5, and non-industrial fixture production.

Following a general discussion of present weight limits and compliance problems, M. N. Waterman, of the Building Materials Division of the War Production Board, who presided over the committee meeting, told the group that the reason for the December 1 relaxation of prohibitions to allow manufacture of commercial type fixtures is that existing stocks of fabricated fixtures are declining and there is a growing need for non-industrial fixtures for lighting offices and drafting rooms. Yet there is no intention of letting these fixtures be sold freely for general commercial use.

Meter Purchase Procedure Simplified By New Order

A simplified method by which a prospective purchaser may apply for permission to buy domestic watt-hour meters from existing stocks is contained in an amended Limitation Order L-151, issued November 16 by the War Production Board. All such applications now will be filed with the Regional Utility Inventory Control Offices of WPB. Addresses of the regional offices, which are situated in Boston, New York, Philadelphia, Atlanta, Pittsburgh, Chicago, Kansas City, Mo., Dallas, Denver, Los Angeles, Detroit, Minneapolis and Portland, Ore., are listed in an attachment to the amended order.

Exclusive of certain special conditions such as war housing that cannot be metered with a master meter, replacement of damaged meters, and emergency conditions, the order provides that a prospective purchaser should obtain his requirements of domestic watt-hour meters from such sources of supply as the excess inventories of electric utilities, used meter dealers, and meter repair shops. Information on excess stocks of such meters in the hands of utilities may be obtained from Regional Utility Control Offices.

The amended order includes a list of consideration for passing on applications for the purchase of new meters.

The order revision is intended to encourage the maintenance, repair and conversion of domestic watt-hour meters so as to make the best possible use of existing stocks, and to encourage the balancing of stocks among electric power utilities, WPB said.

Amendments Affect Motor Controller Contactor Size

To prevent unnecessary use of oversize contactors on electric motor controllers, General Conservation Order L-250 was amended early in November by the War Production Board. The order formerly permitted the use of oversize contactors for any controllers in Appendix A under specified conditions. As amended, L-250 permits the use of oversize contactors under the same specified conditions only for controllers listed in Tables 1 and 4 of the Appendix.

In addition, the same size controller must be used for 380 volt service as for 440 volt service, except that the next larger size may be used where the full load motor current at 380 volts exceeds the rating of the controller.

Interpretation 3, issued at the same time, states that controllers covered by L-250 include both those assembled with other apparatus and those mounted individually.

Machinery Price Rules Available In Publication

As an aid to the machinery industry and its 40,000 related establishments throughout the country, the Office of Price Administration has issued a collation of Maximum Price Regulation No. 136 (Machines and Parts and Machinery Services), which gathers together all amendments since the issuance of the regulation.

This regulation provides unified price control for practically all types of machines and parts. The collation, the first issued since June 30, 1942, will provide the machinery and services trade one convenient reference to the price regulation affecting this diverse industry. Previously, it was necessary for persons seeking the proper provision of the regulation applying to his machine or part to search through the many amendments for the answer to his pricing problem.

Under the collation, the manufacturer will now find particularly helpful the carefully compiled index. This will serve as a quick reference to any particular phase of the regulation including the thousands of dissimilar products under control in these highly complex industries. Many added problems of pricing in the machinery industries have risen as a result of the war and the numerous parts used in the construction of such combat material as airplanes, tanks, trucks, and countless other items used in mechanized warfare.

This collation covers the regulation through Amendment No. 106, which has just been issued.

Postwar Planning Group Studies Alabama Problems

President Thomas W. Martin, of Alabama Power Company, appointed a company post-war planning committee whose duties are specifically to study all problems incidental to post-war activities of the company and to prepare for management approval, programs designed to keep the plant and service well in advance of changing conditions following the war.

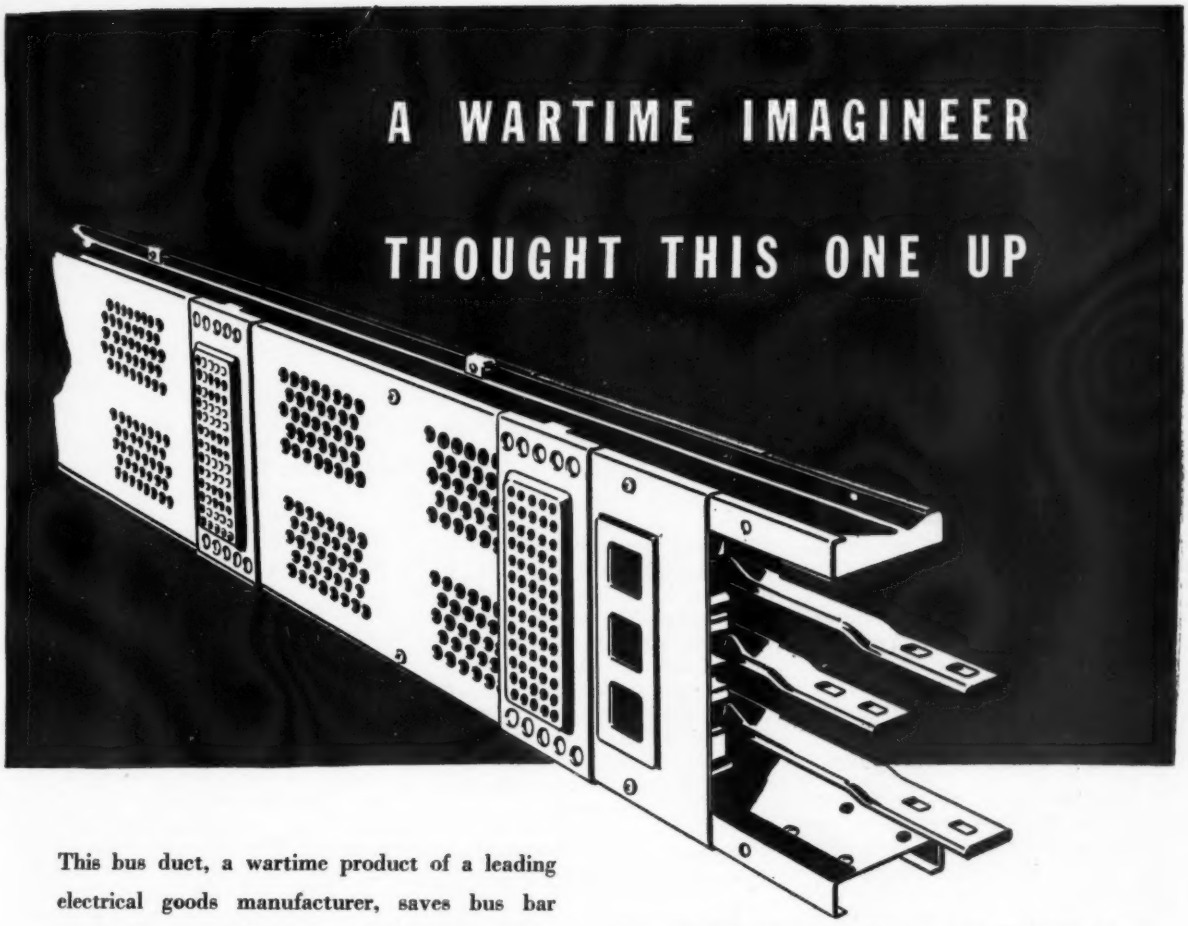
The committee will function as a clearing house for ideas which can be incorporated into a detailed post-war program. They may relate to construction, operations, sales, or personnel, in fact, to all aspects of the business.

A preliminary review of the ideas already received from the general offices and the divisions indicate a very active period for all departments and favorable conditions requiring substantial increases in employment by the Company. The committee consists of F. C. Weiss, chairman; C. T. Brasfield, Jr., D. F. Elliott, J. G. Hitchcock, J. R. Lester, L. M. Smith, and S. J. Spurgeon.

Voters Turn Down Municipal Ownership

Utility circles were encouraged October 26th by failure of the voters of El Paso, Texas, to approve sale of the El Paso Electric

A WARTIME IMAGINEER THOUGHT THIS ONE UP



This bus duct, a wartime product of a leading electrical goods manufacturer, saves bus bar material by permitting heat to be dissipated faster; smaller bus cross sections can be employed for equal ratings. And it saves on the housing material by using perforated metal instead of solid sheet.

This is an excellent example of what we mean by *Imagineering*. Some engineer departed from standard channels of thinking, and produced a "substitute" which may have its effect on future construction.

Now, when postwar designers say, "Make both the bus bar and the housing of Alcoa Aluminum," that will be plain, good *Engineering*. The weight savings effected by building with aluminum means less burden to be carried by supports. Aluminum bus bars have ample current-carrying capacity and aluminum housings provide additional electrical advantages.

Prewar power lines of A.C.S.R., Alcoa Aluminum bus bars and housings, are serving thousands of war industries—visible evidence that it pays to Imagineer with aluminum. ALUMINUM COMPANY OF AMERICA, 2164 Gulf Bldg., Pittsburgh, Penna.

IMAGINEERING AT WORK

ALCOA A·C·S·R

Co. to the municipality. They hailed it as further evidence that interest in municipal ownership of public utilities is on the decline, pointing out that in only one election this year has a proposal for Government operation of a utility won. The El Paso vote was 2,475 against the proposal to 651 in favor of it.

In the first ten months of this year six elections have taken place and only in the case of Estes Park, Colo., a community of less than 1,000 persons, was municipal ownership approved. In Biloxi, Miss., a proposal to buy the Southwestern Gas & Electric Co. property was beaten better than 8 to 1. Gulfport, Miss., turned down a plan to buy the same company's property there by about 2 to 1. Safford, Ariz., voters refused to acquire the Arizona General Utilities property there by 5 to 4. In Clinton, Iowa, renewal of the franchise of a private utility company was voted at the polls.

Broader Scope Planned For G-E Finance Company

The formation of the General Electric Credit Corporation, and investment company organized under the New York State Banking Law, has been announced by the General Electric Company. The new organization will broaden the scope of activities carried on since 1933 by the General Electric Contracts Corporation, and will include the business of the latter company which was principally financing the sale of consumer goods.

Management of the new company will be the same as that of the General Electric Contracts Corporation with G. F. Mosher, president. The main office of the new corporation will be at 570 Lexington Avenue, New York City, and branches will be established in other principal cities.

The immediate function of the new investment company will be to provide financing for war construction and production work in connection with contracts which involve the use of products of General Electric and its associated companies, or parts produced by others for incorporation in such war products. Many of these smaller companies, Mr. Mosher declares, need more capital to handle war contracts than they required in peace time and find some difficulty in obtaining credit.

The new company will have the advantage of General Electric's intimate knowledge of the type of war work involved in the contracts and close contact with many of the contractors. In the postwar period, the new company will not only provide financing for the purchase of consumer goods, but will also furnish increasing assistance in the purchase of other products of the company.

The General Electric Contracts Corporation has been engaged in financing the sale of General Electric products, particularly electrical appliances. Although such activity has naturally been sharply curtailed by the war and the consequent conversion of General Electric to all-out war production, it is intended that this business will be carried on by the new company. It is expected that such business will assume even greater proportions after the war.

Inquiries may be referred to General Electric Contracts Corporation of Georgia, 187 Spring St., N. W., Atlanta 3, Georgia.

Hotpoint Sales Executive Urges Postwar Planning

Independent electrical appliance manufacturers must begin actual post war planning now if they are to survive post war merchandising competition, according to George H. Smith, general sales manager of Hotpoint, in the first of a nation-wide series of Hotpoint sales meetings held in New York on November 9th.

"The first and by far the greatest threat to our present method of doing business is the chain operator. Make no mistake about it; if the chain operators develop their stores into mass outlets, there will cease to remain a place in the picture for the small independent retailers as we know them today," Mr. Smith declared. "And if this business goes to large mass outlets, the basic functions of wholesaling will become a small factor in the major appliance business.

"We are not crying 'Wolf'! It can happen to us. If we are not prepared to meet this type of competition with proper plans, then we will go the way of the old time grocer, who stood by and watched the chain stores revolutionize the methods of merchandising food.

"If we are to survive, and I think we will, we must become merchandisers in a new sense of the word. We must select our retailers carefully and see to it that they are trained as merchandisers. We must help them with every function of their business. Above all, we must see to it that they are experts on the product lines they handle and the best-trained salesmen that we can possibly make them."

Specialty Distributors Needed

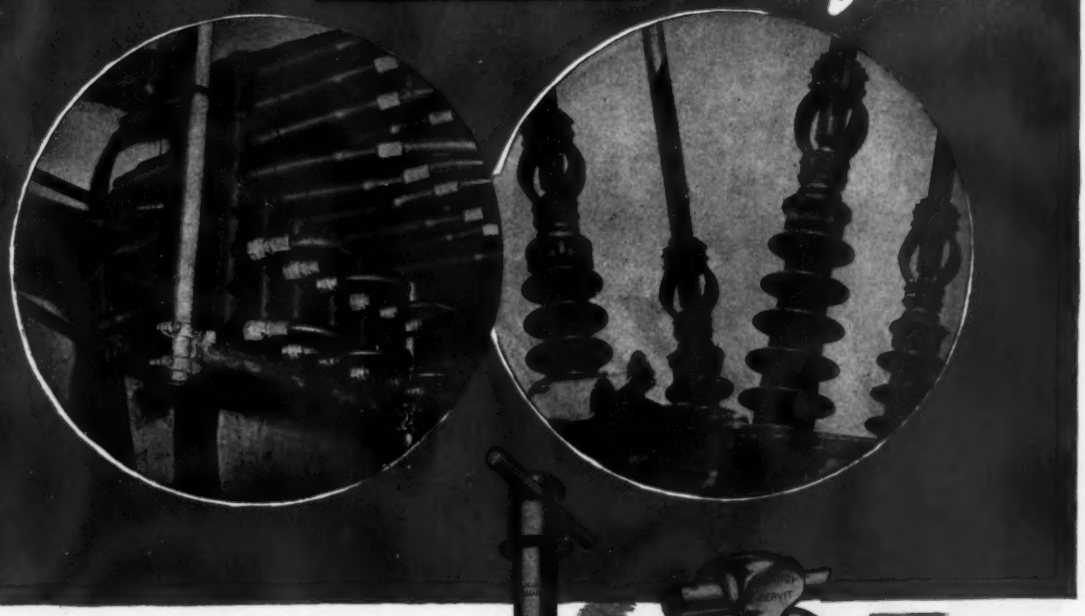
"It all sums up to this: Our contributors must become specialty major appliance distributors. They can no longer run the appliance business on the basis of an electrical supply business. The executives, sales manager, and field salesmen cannot be order takers; they must be trained merchandisers and supply an adequate service to the end that retail outlets can successfully compete with the chain operator. We must promote and sell a complete line of products. We must be ready to do it immediately when products are available.

"To show that Hotpoint is sincere in devising plans which will assure retailers of their proper place in the picture during the post war period, we have retained Charles Low, one of the greatest merchandising minds in this country, to write a series of bulletins which will be sent to any retailer upon request. Mr. Low has had years of merchandising experience in every phase of retailing and distribution, and has been retained by many large organizations to help them in their merchandising programs, particularly in developing proper retail methods.

"We are going into this business of establishing Hotpoint on a solid foundation with all that we have, and I feel certain that the distributor who plans now to meet the problems ahead will not only meet the competition, but materially increase both his volume and his profit."

In addition to the New York meeting, Mr. Smith's itinerary took him before Hotpoint District sales meetings at Atlanta, Georgia—Nov 12; Salt Lake City, Utah—Nov. 23; Seattle, Washington—Nov. 29; San Francisco, California—Dec. 2; and Los Angeles, California—Dec. 6.

WE'VE KEPT THE FUNDAMENTAL JOB *in focus!*



BURNDY'S *leadership* in electrical connectors now covers the aviation, marine and all other war industries . . . thanks to years of pioneering with the utilities in the development of connectors for all utility requirements. But even under the pressure of turning out connectors *literally by the millions* for war needs, Burndy's thoughts and engineering planning have remained focused on the years ahead. For the backbone of the great electrical era coming will be the utility . . . and headquarters for utility connector requirements will remain here . . . at Burndy.

UTILITY
Headquarters for connectors

BURNDY
ELECTRICAL CONNECTORS

OVERHEAD • UNDERGROUND • POWER • WIRING • GROUNDING

BURNDY ENGINEERING CO., INC. • 107 EASTERN BOULEVARD, NEW YORK 54, N. Y.
IN CANADA: CANADIAN LINE MATERIALS, LTD., TORONTO 13, CANADA

ANOTHER
FIRST FOR G-E
RESEARCH...
Watch Dog
REG. U. S PAT. OFF.
FLUORESCENT STARTER
IT STARTS 'EM HOT AND STOPS 'EM COLD
FOR 40-WATT LAMPS...READY NOW
Shipments of the FS-40 Watch Dog starters can be made immediately on your plants, based on priority ratings. For example, a shipment for a plant with an AA-2x rating can be made promptly from Distributors' stocks.
FOR 100-WATT LAMPS...AVAILABLE DECEMBER 1
THE BEST INVESTMENT IN THE WORLD IS IN THIS COUNTRY'S FUTURE—BUY WAR BONDS
GENERAL ELECTRIC

AMAZING NEW G-E RESEARCH DEVELOPMENT MAKES FLUORESCENT LIGHTING MORE EFFICIENT THAN EVER

HERE are General Electric's latest achievements to make fluorescent lighting more efficient than ever . . . the G-E FS-40 and FS-100 Watch Dog fluorescent lamp starters. These new starters, the result of the combined efforts of the G-E Research Laboratories at Nela Park and Bridgeport, offer several outstanding advantages over standard starters:

1 **Prevents flicker** that annoys workers and slows up war production.

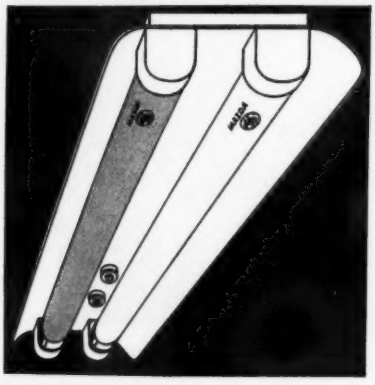
2 **Conserves electricity** by preventing burned-out lamps from being started needlessly.

3 **Increases life of fluorescent auxiliaries.** The average life of the FS-40 Watch Dog is equivalent to the life of ten 40-watt fluorescent lamps compared to two or three with standard starters (Under specified test conditions the FS-40 outlasted an average of ten fluorescent lamps.) Ballast life is also lengthened.

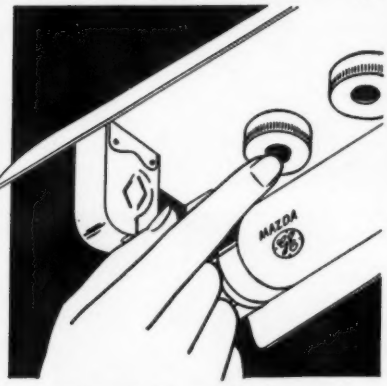
* * *

Distribution and sales of the Watch Dog starters are handled through the Appliance and Merchandise Department. For new Fluorescent Accessories Catalog write to Section GN-1136-F, General Electric Company, Bridgeport, Connecticut.

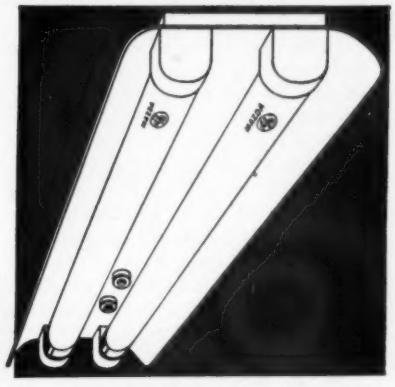
HERE'S HOW NEW "WATCH DOG" STARTERS WORK!



1 When the lamp dies, the G-E Watch Dog cuts out. No flow of current trying to restart dead lamp means no flickering. Current is saved, ballast safeguarded, and starter life prolonged.



2 No "cooling" period is required to reset the starter when replacing a dead lamp. Starter remains in fixture and is reset by pressing button before new lamp is put in.



3 As soon as the new lamp is inserted, the G-E Watch Dog Starter brings it into the circuit immediately, resuming normal lamp operation.

General Electric Lamp Research is responsible for much of the good lighting that is speeding war production today. The never ending goal of that great research organization is to make General Electric lamps stay brighter longer.

MADE TO STAY BRIGHTER LONGER

Hear the General Electric radio programs: "The G-E All-Girl Orchestra," Sunday, 10 p.m. EWT, NBC; "The World Today" news, every weekday, 6:45 p.m. EWT, CBS.

Collier Heads Georgia Power Postwar Planning Committee

C. A. Collier, vice-president in charge of sales and customer service, recently was appointed chairman of the Georgia Power Company's Postwar Planning Committee by P. S. Arkwright, president.

Other members of the company-wide committee appointed by Mr. Arkwright are C. B. McManus, assistant operating manager; W. R. Pollard, manager of the transportation department; J. M. Stafford, Jr., assistant manager of the advertising department, and L. M. Shadgett, of Athens, division vice-president.

According to Mr. Arkwright's announcement of the appointment of the five men to the postwar planning committee, "they are to suggest a plan and program to prepare the company to meet the conditions following the war and report such plan and program to the president for approval."

H. B. Robinson to Head North Carolina AIEE

H. B. Robinson, of Raleigh, vice president in charge of operation of the Carolina Power and Light Company, was elected chairman of the North Carolina section of the American Institute of Electrical Engineers at the section's annual meeting at Raleigh in November. Mr. Robinson, who will take office along with other new officers on January 1, succeeds John J. Strickland, of Durham, general superintendent of the Durham Public Service Company.

L. M. Keever, of electrical engineering school faculty at North Carolina State College, Raleigh, was elected secretary-treasurer to succeed Guy H. Bennett, of Durham, of the Durham Public Service Company.

Otto Meier, Jr., of the electrical engineering faculty, Duke University, Durham; H. W. Oetinger, of the Duke Power Company, Charlotte; and George F. Stratton, of the Armature Winding Company, Charlotte, were elected members of the executive committee.

With Chairman Strickland presiding, an afternoon business session was held at North Carolina State College. Roy L. Williamson, commissioner of public works at Raleigh and president of the North Carolina Society of Engineers, spoke on "Cooperation of Engineering Groups in North Carolina," and technical papers were presented by Herman B. Wolf, Peter Doub Strum, and Joseph E. Clem.

At an informal dinner at the Sir Walter Hotel which brought the meeting to a close, Dr. Nevin E. Funk, president of the AIEE., and vice president in charge of engineering of the Philadelphia Electric Company, spoke on "Modern Frontiers." Dr. Funk was introduced by L. V. Sutton, president of the Carolina Power and Light Company.

PERSONAL NOTES
About Men You Know

Ray W. Turnbull, executive vice-president of the Edison General Electric Appliance Company, Inc., makers of Hotpoint electric appliances, was elected president of the company on October 28, 1943, according to an announcement by George A. Hughes, chairman of the board. Mr. Turnbull's election to the presidency climaxes thirty-three years of service to the Hotpoint organization.

A. D. Byler, who retires as president because of ill health will remain with the company as a consultant to the president, and also as a member of the board of directors.

Ray W. Turnbull

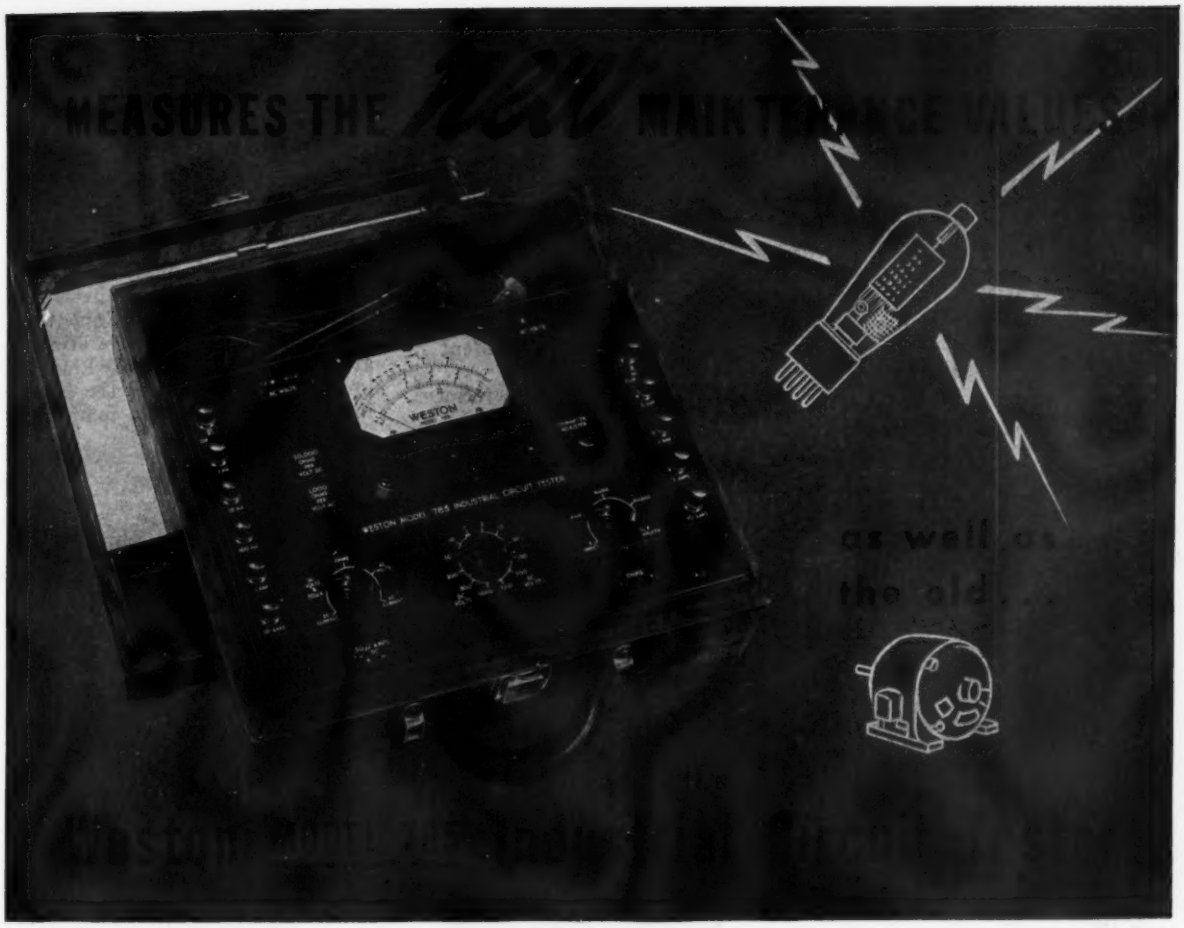
Starting with the original Hotpoint company in 1910—shortly after the company was founded—Mr. Turnbull is one of its oldest employees. He came up the hard way, working his way through the factory assembly lines, then to order service, next advertising, and eventually became sales manager. He was elected vice-president in 1931, and progressed to executive vice-president in 1940.

Sam Schwieger has been appointed advertising manager of Southwestern Gas and Electric Company, at Shreveport, La., succeeding **A. J. Kane,** who has resigned to go into business for himself.

Sam Schwieger

Mr. Schwieger was born in Oklahoma and attended public schools in that state. He received his A. B. degree from University of Oklahoma in 1931 following which he was managing editor of Medford, Okla., Patriot-Star, semi-weekly newspaper, for a year. He then went to Perry as managing editor of Perry Daily Journal, a position he held for six years.

In 1938 he became the first secretary-manager of Arkansas Press Association, with offices at Fayetteville. During the five years he served as secretary-manager, the Association grew from a membership of 60 newspapers to 143 newspapers, dailies and weeklies. All but twelve weeklies in the state were members of the Association at the time he resigned in August to accept the position



RANGES

D-C Voltage—*Measurements from 10 millivolts to 1000 volts (20,000 ohms per volt) in full scale ranges of: 1/10/50/200/500/1000 volts. (Up to 5000 volts with very compact external multiplier.)*

A-C Voltage—*Measurements from 0.1 to 750 volts (1000 ohms per volt) in full scale ranges of: 5/15/30/150/300/750 volts.*

D-C Current—*Measurements from 0.5 microampere to 10 amperes, in full scale ranges of: 50 microamperes, 1/10/100 milliamperes, 1/10 amperes. (Higher ranges with external shunts.)*

A-C Current—*Measurements from 10 milliamperes to 10 amperes, in full scale ranges of: .5/1/5/10 amperes. Higher ranges, up to 1000 amperes, with external current transformers.*

Resistance—*Measurements from 0.5 ohm to 30 megohms in full scale ranges of: 3,000/30,000/300,000/3 meg./30 meg. Center scale values are: 25/250/2,500/25,000/250,000 ohms.*

• The growing use of electronic devices and other sensitive circuits throughout industry poses no new instrument problems for contractors or maintenance departments WESTON equipped. The familiar Model 785, with its high sensitivity and broad range scope, answers these *newer* measurement requirements. But more . . . it also covers most of the *usual* maintenance needs.

Model 785 furnishes another example of WESTON'S engineering foresight . . . designing instruments always with the needs of *to-morrow* in mind. Other WESTONS, equally important for efficient maintenance in the days to come, are the time-saving WESTON Clamp Ammeter, and the WESTON foot candle meters which measure all types of lighting direct . . . *without correction factors.* Weston Electrical Instrument Corporation, 578 Frelinghuysen Avenue, Newark 5, New Jersey.

Laboratory Standards . . . Precision DC and AC Portables . . . Instrument Transformers . . . Sensitive Relays . . . DC, AC, and Thermo Switchboard and Panel Instruments.

WESTON

Specialized Test Equipment . . . Light Measurement and Control Devices . . . Exposure Meters...Aircraft Instruments... Electric Tachometers...Dial Thermometers.

FOR OVER 55 YEARS LEADERS IN ELECTRICAL MEASURING INSTRUMENTS

as editor of Northwest Arkansas Daily Times at Fayetteville, which position he resigned to accept employment with Southwestern Gas and Electric Company.

* * *

Election of **M. M. Greer** as vice-president in charge of engineering of Edwin L. Wiegand Company, Pittsburgh, Penna., was announced on November 10 by **E. N. Calhoun,** president. The company manufactures Chromalox electric range units and industrial electrical heating units and equipment.

M. M. Greer

Mr. Greer joined the company in 1928, as an engineer in the experimental department, after graduating from Massachusetts Institute of Technology and serving two years as a metallurgist in the steel industry.

H. R. Miles succeeds Mr. Greer as manager of industrial sales.

* * *

Announcement has been made by **Alfred J. Kieckhefer,** president of National Enameling and Stamping Company, Milwaukee, that **Dale D. Karsteadt** has returned to the company in the capacity of advertising manager. He is returning to the Milwaukee position he held in 1936 to 1938, from the Racine Journal, where for the past five and one half years he has been advertising manager.

* * *

The appointment of **Peter L. Lenz** as manager of the Middle Atlantic District Manufacturing Company, was announced recently by **H. F. Boe,** vice president of the company.

Mr. Lenz, who was formerly manager of the Homewood Manufacturing and Repair Plant, Pittsburgh, will make his headquarters in Philadelphia. His new duties will include general supervision of two manufacturing and repair plants in Philadelphia, one each in Wilkes-Barre, Pa., Huntington, W. Va., and Baltimore, Md.

* * *

Announcement has been made by **Alfred J. Kieckhefer,** president, National Enameling and Stamping Company, Milwaukee, that **Michael N. Brady** has joined the Nesco organization as vice-president in charge of sales. For the past 13 years, Mr. Brady has been associated with the United States Rubber Company. He started with them as district sales manager, Birmingham, Alabama, in 1930. Successively, he has held similar sales positions in Syracuse, New York, New York City, Baltimore, St. Louis and Chicago. He resigned the position of Central Division Sales Manager Detroit to join the National Enameling and Stamping Company.

Michael N. Brady

* * *

T. O. Eaton has been appointed manager sales, Power Transformer Section, at General Electric's Pittsfield Works, according to an announcement by **L. R. Brown,** manager of the Transformer Division, Central Station Divisions.

E. D. Monk, Mr. Eaton's predecessor, who has been with the company 34 years, will continue as a member of the section for consultation and special duties.

A native of Virginia, Mr. Eaton received his degree in electrical engineering from the University of Wisconsin in 1924. He became affiliated with General Electric in 1925 when he joined the drafting department at the company's Schenectady Works. The following year, he entered the test course there and in 1930 was transferred to Pittsburgh as a switchgear specialist.

T. O. Eaton

* * *

Cutler-Hammer, Inc., Milwaukee, manufacturers of motor control apparatus, has just announced the appointment of **P. S. Jones** as general sales manager for the company. In his new duties Mr. Jones will have direct supervision of sales for the company through its

Dale D. Karsteadt

P. S. Jones

thirty selling territories throughout the country.

Mr. Jones first became associated with the company at Milwaukee as a sales engineer in 1915, and he was transferred to the Pittsburgh office in 1919, where he was later appointed as branch manager of the Pittsburgh Sales Territory. For the past fourteen years prior to his new appointment Mr. Jones was in charge of the New York sales territory.

Mr. Jones is a graduate of the Ohio State University where he obtained his B. E. E. in 1915.

* * *

The appointment of **James B. Hawkins** as manager of the Central Division of Virginia Public Service Company has been announced by **H. L. Crumley,** vice president of the company. Mr. Hawkins will succeed **Raymond Hunt** who has been assigned special duties with the General Engineering Department of the Company. Both men will have headquarters in Charlottesville.

Mr. Hawkins is a native of Clifton Forge, Virginia, and a graduate, class of 1925, of V. P. I., where he received his B. S. Degree in Electrical Engineering. He spent one year in the Test Department of General Electric Company, in Schenectady, New York. In 1926 he joined the V. P. S. organization as division engineer for the Western Division and manager of the Clifton Forge District. In February, 1940, he was transferred to Alexandria as superintendent of operations for the Northern Division, which position he held until his recent transfer to Charlottesville.

* * *

Appointment of **M. C. Funk,** of Ashland, Ky., as vice president and general manager of the Appalachian Electric Power Company, effective December 1, with headquarters at Roanoke, was announced November 6th by **John W. Hancock.**

Simultaneously, it was announced that **W. I. Whitefield,** of Roanoke, has been appointed division manager of the company's Roanoke-Lynchburg Division, effective December 1, succeeding Mr. Hancock who will remain with the company in an advisory capacity; and that **G. L. Furr,** of Bluefield, W. Va., has been appointed division manager of the Bluefield division, effective De-

LIGHT
CLOSE TO THE WORK
Better lighting is a "must" in industry today—a means of attaining smoother, faster production after every other production aid has added its push
BullDog Universal Trol-E-Duct makes possible that better lighting—brings the light right to the work—makes it easy to move or rearrange lights, or entire lighting systems, at any time and without interfering with production.
UNIVERSAL Trol-E-Duct
POWER
CLOSE TO THE TOOL
Don't waste valuable production time while workers look for power outlets for portable tools. Don't risk accidents due to tripping over long cords, or shorting tangled cables.
Bring the power right to the job with BullDog Industrial Trol-E-Duct — the system that not only furnishes mobile power, but also support, for portable tools.
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MANUFACTURERS OF a complete line of Vacu-Break Safety Switches, Panelboards, Switchboards, Circuit Master Breakers and BUStribution SYSTEMS.

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You SAVE What You SPEND for WAR BONDS

BullDog Universal Trol-E-Duct *for light,* and Industrial Trol-E-Duct *for mobile power,* are both furnished in standardized, interchangeable sections. Both are completely salvable, suitable for quick removal to a new department or to a new plant.

Ask for complete illustrated bulletins Nos. 425 and 407, describing these two time and money saving, production speeding, BullDog systems.

cember 1, succeeding **Herbert Markle** who will remain with the company in an advisory capacity.

Mr. Funk, a native of Galax, Va., and connected with the company for 29 years, began his service as superintendent of construction and later became general superintendent and then manager of the Tug River Company, in Kentucky. Subsequently, he became manager of the Kentucky & West Virginia Power Company, and in 1938 was appointed vice president-general manager and director of that company with headquarters in Ashland, Ky.

Mr. Whitefield who has been with the company for 28 years, began his service as power engineer at Roanoke and was successively assistant superintendent of lighting and power, district manager and assistant division manager, which position he has filled since 1940. He was a graduate of Virginia Military Institute.

* * *

Two new managers in the Industry Department of the Westinghouse Electric and Manufacturing Company have been appointed by **B. W. Clark,** vice president of the company. They are **C. F. Lloyd,** manager of the General Contract Department, and **Tomlinson Fort,** manager of the Central Station Department. Headquarters of both men will remain at the East Pittsburgh Plant. Since February 15, 1940, Mr. Lloyd has been assistant manager of the same department.

C. F. Lloyd **Tomlinson Fort**

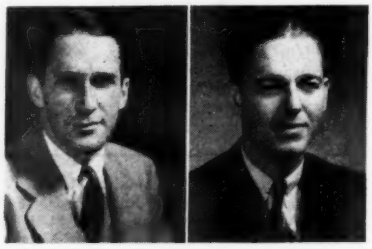
Born in Trappe, Md., Mr. Lloyd was graduated from St. John's College at Annapolis, Md., in 1906 and immediately went to work for Westinghouse. He had experience in the power correspondence department and high voltage transmission operations and in 1909 was transferred to the substation section of the Railway and Lighting Department. He then became manager of the electric division in the Power Department and in 1939 was named manager of the Central Station Sales Department. When the Transportation Sales Department was combined with his group in 1940, Mr. Lloyd was named manager of the new operation, known as the Central Station and Transportation Departments.

Mr. Fort was born in Atlanta, Georgia, starting with Westinghouse as a graduate student in 1923, soon after his graduation from New Mexico A. & M. College. After a training period at the East Pittsburgh Plant, he was assigned to headquarters sales until 1927, when he was sent to Albany, New York, in the Company's eastern district. From 1931 until 1940 Mr. Fort was attached to the Westinghouse office in New York. He then returned to East Pittsburgh as assistant manager of the Central Station Department.

* * *

Harry E. Warren, manager of Refrigerator Sales Division of Edison General Electric Appliance Co., Inc., makers of Hotpoint electric appliances, has been appointed manager of the Advertising Division of Hotpoint effective immediately, according to **G. H. Smith,** general sales manager. At the same time, it was announced that **F. F. Duggan,** sales manager of the Refrigerator Sales Division, had been appointed manager of the Refrigerator Sales Division, succeeding Mr. Warren.

Mr. Warren takes over his new position after six years with the Hotpoint organization, during which time he served first as sales manager of the Home Laundry division and more recently as manager of the Refrigerator Sales Division. Before coming to Chicago with Hotpoint, he spent some years as advertising manager of Caswell, Inc., G-E distributors in Detroit, and handled appliance promotion for the Detroit Times.



Harry E. Warren **F. F. Duggan**

Mr. Duggan takes over his new position after nine years with the Hotpoint organization during which time he served as territorial representative in North Carolina; then local branch manager in Charlotte; and Refrigeration Specialist in the Atlanta district. In 1940, he was appointed sales manager of the Refrigerator Sales Division.

* * *

Announcement has been made by **L. A. Clark,** assistant general sales manager of the Frigidaire Division, General Motors Corporation, in charge of advertising and promotion activities, of the appointment of **J. F. Pedder** as advertising and sales promotion manager of Frigidaire's Appliance Division, which is responsible for sales of such peacetime products as Frigidaire household refrigerators, electric ranges and water heaters. Mr. Pedder formerly was assistant advertising manager of this division.

T. W. Markham **J. F. Pedder**

At the same time, Mr. Clark announced that **T. W. Markham,** now on another assignment, will resume his former position as advertising and sales promotion manager of the Frigidaire Commercial and Air Conditioning Division, which is responsible for the sale of such peacetime products as commercial refrigeration equipment, ice cream cabinets, and air conditioners.

* * *

Ralph E. Kruck, who has designed everything from baby carriages to refrigerators, has been appointed manager of the Product Design Department of the Westinghouse Electric Appliance Division. An industrial designer for Westinghouse since 1931, Mr. Kruck will have the job of "appearance-designing" electric ranges, automatic laundering machines and all other appliances the company builds after the war. His headquarters will be at the company's plant in Mansfield.

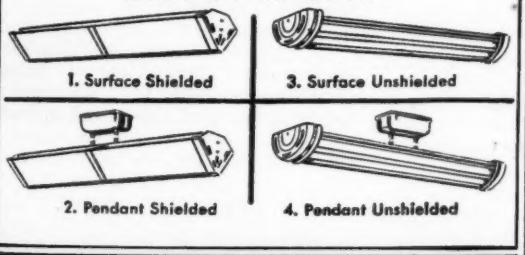
FOR THE FIRST TIME SINCE JUNE 1942

an improved fluorescent fixture

FOR DRAFTING ROOMS AND OFFICES

SYLVANIA-ENGINEERED ADAPTABILITY OF THIS NEW FIXTURE

HANG IT ANY WAY YOU WANT



"EVERYTHING THAT'S FINEST IN FLUORESCENT"

A RECENT WPB order makes it possible to release this new Sylvania commercial fixture, which offers you outstanding flexibility of installation.

Simple, smart, and modern in design, this new model is ideal for factory offices, drafting rooms, schools, and hospitals.

Its semi-direct light distribution provides real visual comfort through shadowless and glare-free illumination.

Light in weight, easy to install and maintain, it has a relatively small load (200 watts), which is seldom heavy enough to require the rewiring of existing circuits.

And you get a complete, pretested package of light — with 40-watt Sylvania Lamps, Mirastat Starters, and high-power-factor Dualamp auxiliary — completely wired and ready for installation.

This model — unshielded C-200R and shielded C-201R — is available to you on a priority of A-1-J or better, with specific WPB approval required for continuous row installations. It carries Underwriters' Laboratories inspection label and Sylvania's own guarantee. Write for further details, specifications, and prices.

SYLVANIA

ELECTRIC PRODUCTS INC.

Ipswich, Mass.

INCANDESCENT LAMPS, FLUORESCENT LAMPS, FIXTURES AND ACCESSORIES, RADIO TUBES, OTHER ELECTRONIC AND ELECTRICAL DEVICES

NEW EQUIPMENT and MATERIALS

G-E Dry-Type Transformers

A new design of General Electric's line of indoor dry-type transformers for primary circuits 601 to 15000 volts provides greater safety and ease of installation than previous dry-type designs, as well as giving them an outward appearance of the latest model room-type air conditioning units. A radical departure from the screened enclosure which has characterized some of the dry-type units in the past, the new design employs sheet steel with flowing lines, smoothly rounded corners, and a two-tone gray finish.

According to the company's transformer engineers who designed the case, weight of the material used for the new enclosing case is less than that for the old screened enclosure. In addition, the new case provides improved and directed circulation of the cooling air.

The new case is highly functional, being designed especially for indoor installations in industrial plants. Horizontally louvered sections on two sides of the case can be removed easily making the interior accessible for cleaning and tap changing. The taps are brought to a convenient terminal board located just below the edge of the casing and close to a diagrammatic nameplate. The deeply pitched louvers provide an outlet for the cooling air. Air is taken in at the bottom of the case through a screened opening along the bottom of each side, and is circulated through and around the coils by convection.

All live parts are metal enclosed, various portions of the case being separately removable. The high-voltage terminal compartment cover can be removed to facilitate connecting the transformer to the supply circuit.

Dolph "Synthite PG-4"

A new electrical insulating varnish which has proved very satisfactory for use on high speed armatures and tightly wound fine wire coils has been announced by John C. Dolph Company, insulating varnish specialists.

The new product, known to the trade as "Synthite PG-4 Clear Baking Varnish", is described in a folder just released by the Dolph Company. Among the advantages claimed for the varnish is that it will not throw out nor resoften at high temperatures which are encountered when armatures rotate continuously at high speeds.

Curing of the varnish takes place through heat induced chemical polymerization which brings about complete solidification of the entire mass, eliminating the possibility of wet spots in the interiors of windings. The degree of hardness can be controlled by altering the baking time and temperature.

For further information on this new varnish, write direct to John C. Dolph Company, Department 23, 168 Emmett St., Newark, N. J.

Silex Filter Counter Display

Containing twelve individual packages, the New Silex No-Cloth Filter Counter Display Carton is being distributed to the trade by The Silex Company, Hartford, Connecticut. This striking carton in silver, red and blue has a unique cut-out cover, in which a Silex No-Cloth Filter is inserted for display.

The principal selling features of the product, according to the Company, are that it "Requires No Cloth," "Wash Bowl Without Removing Filter," "Locks Tight — Can't Wobble—Fall Out or Break Bowl," and "It Is Almost Unbreakable." The New Silex No-Cloth Filter is made of white moldex and fits most all makes of vacuum glass coffee makers. It makes for greater convenience in coffee making and brews clean, clear coffee.

Tube Substitution Charts

A concise pamphlet containing charts and all necessary data on radio tube substitutions has been compiled by Sylvania Electric Products Inc. engineers as a wartime help to radio servicemen, and is available free of charge from Sylvania distributors or direct from Sylvania, at Emporium, Pa.

The pamphlet includes substitution charts for 150 milliampere AC-DC receiver tubes, 300 milliampere AC-DC receiver tubes, and battery tube types, carefully edited to conform with the WPB civilian radio tube program. The pamphlet shows quickly the required receiver and modifications necessary for tube substitutions, helps solve difficult tube substitution problems, and gives first and second choices in possible replacements in an easy-to-use check list. The pamphlet fits standard-size loose-leaf binders.

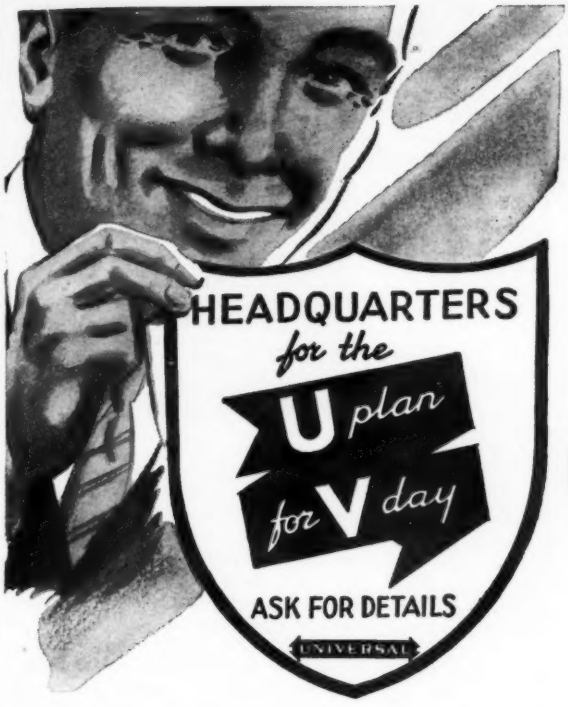
Cold Cathode Lighting

A new bulletin issued by the Acme Electric & Mfg. Co., Cuba, New York, describes the differences between cold cathode lighting and fluorescent lighting. This bulletin briefly discusses the utility, adaptability, color harmonics, safety, efficiency and the future possibilities of the continuous tube (cold cathode) light source.

This catalog likewise illustrates eight exceptionally fine installations of this form of lighting in retail stores, factories and business offices. Specifications and dimensions of four standard industrial type cold cathode lighting transformers and twelve commercial type cold cathode lighting transformers are included.

Smithcraft Fluorescents

Even though official regulations have reduced to a minimum the steel content of fluorescent lighting units,



DON'T MISS *this* OPPORTUNITY!

Become a "U" Plan for "V" Day Dealer Today!

Profit from the terrific impact of 40 million full page color messages in 14 national magazines which will invite customers to your store for post-war planning in 1944. Universal is glad to contribute the "U" Plan for use by all appliance and housewares dealers. You invest no money—you simply write to Universal for the free Plan Book and then ask for the package of point-of-sale materials including decals, blow-ups of national advertising, consumer folders, War Bond envelopes and priority certificates.

The "U" Plan Helps You Immediately!

1. By developing store traffic for the immediate sale of available merchandise.
2. By bringing you into contact with prospects for immediate appliance servicing.
3. By renewing friendly relations with old customers and by introducing you to that big 3 million market of newly-weds.
4. By identifying you with a nation-wide effort to step up the sale of War Bonds.

It Helps You in the Post-War Period!

1. By providing a flexible, fair and orderly method of handling a large volume of business.
2. By creating a backlog of potential orders identified as to customers' names and addresses.
3. By lower selling costs.
4. By directing customers into your store without the expense of field calls or other promotion.
5. By indicating the type and price range of items likely to be demanded by your customers thus guiding your purchases more accurately.

Establish your store now as appliance and housewares headquarters for greater present and post-war sales. For complete information, write to your nearest Universal distributor or to Dept. ES, Landers, Frary & Clark, New Britain, Conn.

UNIVERSAL

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LANDERS, FRARY & CLARK ☆ New Britain, Conn.

TO PREVENT WRINKLES IN SMALL RADIUS BENDS

- Forms smooth, neat-looking bends up to 180°
- Special clamping device stops kinks
- Sizes for thin-wall conduit (EMT); rigid conduit & pipe; all types of tubing
- Fast, easy to operate

Use GREENLEE Hand Benders

Forming small-radius bends in tubing, conduit, or pipe, without wrinkles, kinks, or serious distortion, is a simple task with Greenlee Hand Benders. They form neat bends for sharp nooks and corners . . . save up to 75% in time and material on many jobs. Special clamping device prevents slipping . . . stops kinks. There's a size for most jobs, including powerful hydraulic benders for conduit and pipe up to 4½" size.

WRITE FOR NEW CIRCULAR S-120

MAIL COUPON FOR FULL FACTS ON GREENLEE TOOLS

GREENLEE TOOL CO.
1772 Columbia Ave., Rockford, Ill.
Please send full details on Hand Benders—Circular S-120. Also data on hydraulic Benders ☐ Pipe Pushers ☐ Cable Pullers ☐ Knock-out Punches and Cutters ☐

Name.. .....
Company .....
Address .....

the new die-formed steel housings of Smithcraft units have, by actual loading tests, been proved to be of ample strength. In addition, Smithcraft box girder design with two cross bridges assures the extra sturdiness which makes for trouble-free performance. Illustrated is a new kind of loading test which may be a bit unusual, but which nevertheless is impressive evidence of Smithcraft's ability to "take it". The Smithcraft units are manufactured by A. L. Smith Iron Company, Chelsea, Mass.

Louverplas Lamp Shields

Visual efficiency is sharply increased when the light source is shielded from the eyes. "Louverplas", the louvered plastic sheet, was specifically designed to shield the fluorescent lamp, which could not be controlled lengthwise by means of a reflactor alone. "Louverplas" embodies the principle of louvers for endwise shielding of the lamp and refracting prisms for broadside control.

"Louverplas" White RF Glare Zone Covers, installed on industrial reflectors used for general illumination, will shield the lamps and protect the eyes within the glare zone, which is the angle formed by the horizontal plane of the lamp down to 45°. Within the glare zone, soft diffused direct light only reaches the eyes; simultaneously high intensity light is directed to the work area; efficient seeing results.

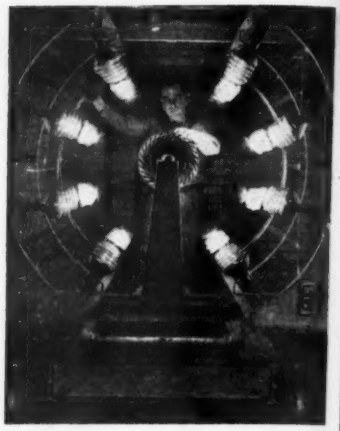
Black "Louverplas" Inspection Covers, installed on local lighting reflectors, are recommended for inspection tasks requiring severe visual concentration for prolonged periods. The black louvers will completely intercept and stop direct glare-light reaching the eyes of the worker. The work will be high intensity lighted, and the result will be:—stepped-up and better inspection.

For further information on Louverplas write to Ivan T. Johnson Co., Inc., 95 Madison Ave., New York 16, N. Y.

Radiant Heat Drying

Insulating varnish on rewound armatures is dried in one-half to one-third the time by 120-250 watt Westinghouse infra-red lamps. An 18" armature requiring 30 hours in the convection oven is baked in 8 hours under infra-red, while a small 6-inch armature requires less than half this time to bake out.

First cost and installation time were reduced by using the original brick oven. The old doors were removed, the roof ventilated, and the two banks of lamps suspended on



barn door hangers. Each bank of 60 lamps consists of four rows mounted in a semi-circle, with a 27-inch radius. The barn door hangers permit moving the banks so the lamps may be placed the proper distance from the armature surface irrespective of its diameter.

Each group of five lamps is controlled by a 20 ampere safety switch. 24 such switches provide maximum flexibility of control. The lamps are in three groups of five 15-inches apart to bake out three armatures simultaneously. The power supply is single phase, three-wire, and the total load is 30 kw.

Safety Lamp Guard

The new vaporproof portable guard, recently announced by the McGill Manufacturing, Inc. of Valparaiso, Indiana, should prove a welcome answer to an old problem in safety. The new McGill vaporproof safety guard (No. 3007) is entirely free from exposed metal, shockproof and non-sparking. And of equal importance, the splashing of liquids cannot cause breakage of the light bulb. This bulb is covered by a heat and impact resisting, airtight globe, which is protected by a strong fibre cage.

The cage itself is treated to pre-

Need SILVERED-BOWL LAMPS?

You Can Get Them *Via* GRAYBAR

● If you have been doubtful about the *continued availability* of silvered-bowl lamps . . . here's assurance for yourself and your customers. "Their production is continuing" according to G-E Lamp Headquarters.

Naturally, there may be times when delays occur in delivery, as with anything else you buy these days. But you can be sure that silvered-bowl lamps will be as freely available as are other general-purpose lamps.

What's more, you can always count on GRAYBAR to supply silvered-bowl lamps—in most cases from convenient local stocks, and as promptly as possible.

LAMP DEPARTMENT
GENERAL ELECTRIC
COMPANY
NELA PARK ENGINEERING DEPARTMENT

WARD HARRISON
DIRECTOR OF ENGINEERING

NELA PARK
CLEVELAND, OHIO

September 16, 1943

Mr. J. M. Gilbert
Silvray Lighting, Inc.
R.K.O. Building
Radio City
New York, N. Y.

Dear Mr. Gilbert:

I have inquired into the question raised in your letter of September 9th and find that silvered bowl lamp production is continuing and these lamps are as freely available for replacement use as are the other general purpose types of lamps. Of course, delivery schedules on all lamps are from time to time affected by special wartime requirements.

Yours very truly,

Ward Harrison

441-357

NELA PARK IS THE HOME LAMP AND LIGHTING HEADQUARTERS OF THE GENERAL ELECTRIC COMPANY

Here's Why SILVRAY Lighting Saves EYES . . . EXPENSE . . . MATERIALS

For eye comfort at sustained seeing tasks, shadow-free *indirect* lighting is the recognized ideal. Silvered-bowl lamps in SILVRAY luminaires redirect all the direct rays with unmatched efficiency, because the primary reflecting surface is *sealed within the bulb*, protected from dirt and depreciation.

Scientific light distribution from this SILVRAY industrial luminaire gives the effect of a highly reflective "artificial ceiling"—combining the quality of indirect lighting with the simplicity of ordinary open reflectors. This means lower initial costs and lower maintenance costs. Easy to clean and relamp.

Executive Offices:
GRAYBAR BUILDING
New York 17, N. Y.

GraybaR

IN OVER 80 PRINCIPAL CITIES

GraybaR Everything Electrical . . . THAT IT TAKES TO WIN!

LONG
EXTENSION CORDS
are DANGEROUS

save time..
save motion..
promote safety..
with PLUGMOLD

FOR BENCH, WORK TABLE, INSPECTION and TEST RACK, ASSEMBLY and PRODUCTION LINE WIRING. FOR HAND TOOLS, INSTRUMENTS, APPLIANCES, ETC.

Conforms to Federal Specification W-R-32. Listed by U. L. Immediately available on suitable priorities. The Wiremold Company, Hartford 10, Conn.

WIREMOLD

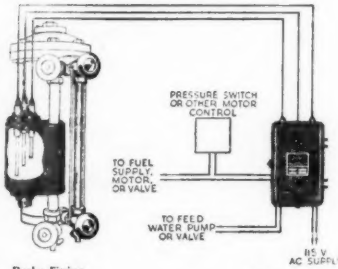
CAN HELP YOU PRODUCE FOR WAR . . . AND PLAN FOR PEACE!

vent warpage and the whole is firmly attached to an unbreakable plastic handle. The handle is fitted with a rubber bushing that, when squeezed into place by the screwnut at bottom, seals the inside airtight and keeps the wire in place. The guard is light in weight, buoyant and will even float when placed in water.

The portable feature of this new guard enables light to be taken where it is needed, even in places hard to reach. It is fitted with a strong fibre swivel hook for convenient hanging near or on the job. That it is filling a long felt need is attested by the fact of its immediate acceptance by flour mills, airports, shipyards, warehouses, aboard ships, food processing plants, display booths, painting booths, and around grinding or cutting machines using a coolant liquid.

New Electronic Control

Combustion Control Corporation, Cambridge, Massachusetts, announces Fireye Electronic Feedwater Controls Series P156N, for maintaining constant boilerwater levels automatically, and for guarding against low-water hazards. Designated to provide the average power plant with low-cost automatic control, the equipment eliminates difficulties encountered with complicated mechanical devices and is guaranteed for an unlimited service-free life.


PRESSURE SWITCH OR OTHER MOTOR CONTROL
TO FUEL SUPPLY, MOTOR, OR VALVE
TO FEED WATER PUMP OR VALVE
115 V. AC SUPPLY
Probe Fitting
Electronic Control

Typical FIREYE Installation For Automatic Boiler Feedwater Control And Low-Level Safeguard

For automatic feedwater pump control and low-water protection, Fireye Type P156N is used with Probe Fitting Type H53, as shown in the accompanying illustration. The probe fitting may be mounted parallel to the water column, or directly on the boiler, and is wired to the electronic control. Three probes within Type H53 mark boiler feedwater pump on and off levels and a low-water danger point.

The top and middle probes determine the high and low levels at which the boiler feed-water pump is turned on and off to maintain constant water level. When water falls below the middle probe, Fireye closes the electrical circuit controlling the pump and water feeds into the boiler. When the level rises to the top probe, the water itself acts as conductor of a minute electrical current which operates the electronic control and turns off the pump. The pump remains inoperative until boiler water again falls to the level of the middle probe.

The lowest probe defines the danger point below which boiler water must not fall. Should water drop below this safety probe, Fireye immediately shuts off the fuel supply and sounds an alarm.

Ideal Fuse Puller

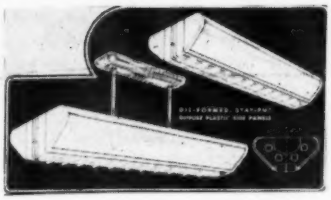
Notched edges that provide a sure positive grip is the outstanding feature of a newly designed fuse puller announced by the Ideal Commutator Dresser Company, 1071 Park Avenue, Sycamore, Illinois.

The fuse puller is made of light weight fibre, assembled to rigid specifications with brass eyelets assuring rugged construction and long life, eliminates the danger of shock when pulling and replacing cartridge fuses by hand or handling other "live" electrical parts. Prevents the bending of fuse clips through improper removal. Also handy for adjusting loose cut-out clips.

Ideal "Safe-T-Grip" fuse pullers are made in four sizes—"Midget" size for handling small fuses, grid leaks, etc.; 1/4" to 1/2" diameter; "Pocket" size—for handling fuses 0 to 200 amperes, 250 volts, and 1 to 100 amperes, 600 volts; "Giant" size—for handling fuses 100 to 600 amperes, 250 volts and 60 to 400 amperes, 600 volts; "Jumbo" size—for handling fuses 200 to 800 amperes, 250 volts and 200 to 600 amperes, 600 volts.

DayBrite Fluorescents

The "Crusader" fluorescent fixture manufactured by DayBrite Lighting Inc., St. Louis, Mo., is a new enclosed unit available for direct ceiling or suspension mounting. (see illustration.) Made for four 40-watt fluorescent lamps only in compliance with the latest L-78 amendment limiting the amount of steel to be used in fixtures of this type. The chassis of these units is of steel, finished in baked white enamel. The body frame and ends are of wood, finished in ivory enamel with a gray trim. Side panels are of die-formed, stay-put plastic, permanently applied to the frame. The entire body is



held in place by spring clips and is easily installed or removed in a few seconds.

The "Parkway" (not illustrated) is an inexpensive open type unit using the same interior chassis as the "Crusader". Wood ends, finished in ivory enamel with gray trim are applied. Available for four 40-watt lamps only, in direct ceiling or suspension type models.

The "E-M Incher"

The E-M Incher is a precise, quick, easy-to-use method of spotting, or slowly rotating, a 3-phase synchronous motor or slip-ring induction motor. Slow-motion, high torque rotation of the motor is provided electrically by using commutated direct current to supply a slowly revolving 3-phase inching current to the motor.

The Incher is particularly valuable in steel mills for positioning or rotating rolls for dressing and changing, backing out cobbles; in cement plants for spotting tube mills for recharging with rods or balls; and for other purposes.

"Nudging" or "inching" the motor with the starter is destructive to starter switches . . . turning the motor with an overhead crane or other mechanical device is clumsy and slow. The E-M Incher eliminates these methods, and does the job quickly and efficiently. Also, since the Incher will revolve the motor in either direction, a reversing switch may be saved.

Write Electric Machinery Mfg. Co., 1331 Tyler St. N. E., Minneapolis, Minnesota, for your free copy of Publication 170.

Virginia Chapter IAEI Meets in Richmond

(*Continued from page 30*)

Fuses Without Time Lag."

J. H. Wenner, Westinghouse Electric & Mfg. Co., East Pittsburgh, opened the concluding session, Wednesday afternoon, with an illustrated talk on fluorescent lighting. He was followed on the program by O. J. Pearre, General Electric Co., Schenectady, who discussed some of the recent developments in electric arc welding.

The meeting was concluded

Protect Wiring
WITH
G-E RIGID CONDUIT

Choose G-E Conduit for use where conditions require the utmost protection for war wiring. *G-E White rigid conduit* is hot-dipped galvanized. This method of manufacture provides a heavier, more durable coating of pure zinc both inside and outside than could be applied in any other way. *G-E Black rigid conduit* has a tough asphaltic-base enamel coating baked on inside and out which remains chemically inert in the presence of corrosive liquids or fumes.

For further information see the nearest G-E Merchandise Distributor or write to Section C1231-16, Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn.

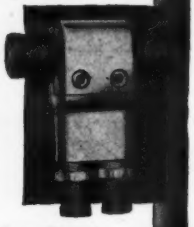
GENERAL ELECTRIC

"You have ALL Types of Tees to choose from—

—in the COMPLETE line"

All in one catalog, for your handy selection — *every* good type of tee connector... Each one carefully designed and tested, and manufactured under rigid engineering supervision.

Penn-Union Type HFM, with one-bolt or 2-bolt hinged clamp for the main. One or more branches can be connected afterward. Multi-slit tapered sleeve assures permanent grip on branch.



Penn-Union Hinged E-Z Tee takes a wide range of branch sizes. One-piece design makes installation easy. Tap connections can be made at any time.

Clamp Type Tees for all sizes of tubing and cable—a complete line. Machined contact surfaces.

Types for All Combinations —for connecting flat bar, run or tap, to tubing or cable. Also "general utility" tees that take a wide range of conductor sizes.

Penn-Union E-Z Tee is ideal for accommodating a large range of conductor sizes on both the main and branch. Will not loosen. 2, 3 or 4-post.

L. MORRIS LANDERS
309 WALTON BUILDING
ATLANTA, GA.

WALTER J. HUEMMER
DALLAS TRANSFER & TERMINAL WAREHOUSE BLDG.
DALLAS, TEXAS

PENN-UNION ELECTRIC CORPORATION, ERIE, PA.

PENN-UNION
Conductor Fittings

with talks by George A. Sawin, of the National Electrical Manufacturers Assn., New York City, and Carl W. Evans, editor, ELECTRICAL SOUTH, Atlanta. Mr. Sawin discussed legislative activities of 1943 related to the National Electrical Code, municipal inspection ordinances, etc. Mr. Evans, as chairman of the IAEI committee on electrical maintenance, discussed the work of the committee and its relation to the state chapters.

Marshall G. Folkes, chief electrical inspector of Richmond, was elected chairman of the Virginia Section for the ensuing year to succeed C. W. Bradley, of Norfolk. W. Edward Dunn, of Alexandria, was elected vice chairman, and A. M. Miller, of Richmond, reelected secretary and treasurer.

Southern District AIEE Meeting

(*Continued from page 29*)

postwar education of service men.

Large numbers of men and women in war plants, Dean Rodman declared, are attending special short courses — usually in three or four weeks—on company time, because their employers realize that the work of special training is more valuable to the organizations. Many others are working during the day and studying at night, in order to get better wartime jobs and to be preparing for postwar work.

Special equipment was the general topic for the Wednesday afternoon session over which J. Elmer Housley, of Aluminum Company of America, presided. "Modern Hydraulic-Turbine Governor Design and Operating Characteristics," was the subject of a paper presented by C. L. Avery of the Woodward Governor Company. This was followed by a paper presented by J. F. Roberts, Allis-Chalmers Mfg. Company, on "Design and Operation of Governor Control for Hydro Units." S. B. Morehouse, of Leeds & Northrup Company, then presented a paper on "Design of Tie-Line Control Equipment."

The afternoon session was concluded with a paper on "Influence of New Materials on Future Design," by R. C. Bergvall, Westinghouse Electric & Mfg. Company. The expansion of our airplane industry has emphasized the possibilities inherent in the use of light weight materials and construction, Mr. Bergvall said, and this influence is bound to be reflected in our ordinary products so that we may look forward to what might be called a "light weight age."

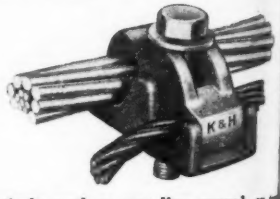
In the early days of the electrical industry, cast iron was the material that was used liberally, even to the extent of making transformer tanks out of it. Purchasers years ago in comparing designs used to look upon weight with great favor but now the pendulum is swinging the other way and manufacturers may more and more be expected to be penalized when their equipment is not light enough, holds too much oil, etc., making necessary expensive local facilities for handling.

Mr. Bergvall said that much has been done in the direction of reducing weight and that he was greatly impressed by the results obtained from a newly developed material, high permeability silicon iron known as Hipersil. The new iron has made much smaller and lighter transformers possible.

Metals that will withstand high temperatures without corroding or flowing like molasses under the influence of stress are going to

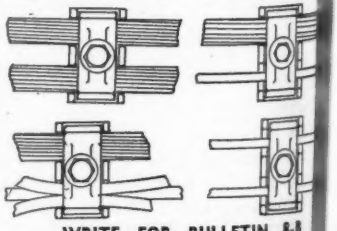
A Live Wire is no better than its Connection

Universal Tap Connect



Effectively used as guy line ground, or t former and lightning arrester connectio A. C. S. R. or copperweld conductors w the diameters may be from 8-A copper to .595" A. C. S. R. armour rods. Wire .595" to 5/32".

ADAPTABLE TO A WIDE RANGE OF



WRITE FOR BULLETIN 8-B

K&H KRUEGER & HUDEP
VINE AT THIRD-ES

become of increasing importance as time goes on, Mr. Bergvall predicted. These alloys will bear watching as they are the keystones that will determine whether or not gas turbines become important to the industry. Although gas turbines have been known since before the beginning of this century, their low efficiency has prevented their being used to any extent. At 750° degrees gas temperature, their thermal efficiency is only a few percent, but at 1500 degrees their efficiency becomes high enough to warrant consideration in the transportation field.

A discussion of the gas turbine is naturally very speculative at the present time, but it does emphasize to engineers who have to plan 20 years ahead the importance of closely watching new materials.

"Electronics in Industry" was the subject of the Wednesday evening session over which Eugene W. O'Brien, of W. R. C. Smith Publishing Company, presided. The guest speaker, E. H. Alexander, General Electric Company, reviewed the many developments already realized in the application of electronics in industry and indicated some of the possible trends of future development.

A. S. Hoefflin, Louisville Gas & Electric Company, presided over the Thursday morning session which brought the technical meeting to a close. This meeting featured three papers on power supply: "New Chesterfield Station" by C. C. Dodge, Stone & Webster Engineering Corp.; "Additional Power Supply, Hampton and Alexandria Stations," by G. M. Tatum, Virginia Public Service Company, and R. H. Boas, Gilbert Associates, Inc.; and "The Paddy's Run Power Station of the Louisville Gas and Electric System," by M. S. Winstandley, Louisville Gas & Electric Company.

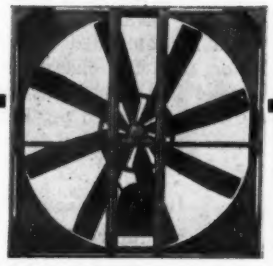
Sales Executives Discuss Problems

(*Continued from page 27*)

return to their homes thoroughly sold on the use of labor-saving appliances. He predicted that it is entirely possible that postwar domestic electrical consumption may reach annual usages per customer as much as two or even two-and-a-half times what it has been.

Such a trend would find thousands of homes without wiring capacity for this greater usage of

NOW IS THE TIME TO SELL
. . . NEXT SUMMER'S NEEDS



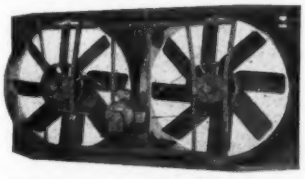
Coolair
TRADE MARK
Exhaust FANS and BLOWERS

WHILE WPB Regulations do not permit us to accumulate a warehouse stock of Coolair Fans, our plant has been able, up to now, to make reasonably prompt shipment on all priority rated orders.

But this favorable situation may not prevail at the time your customer plans to install Coolair Fans for ventilating and cooling workrooms and processing spaces in his plant.

For this reason we urge you to survey his needs, sell the order now and place it with us while we still have the production capacity and necessary materials and supplies for their manufacture and in this way insure prompt delivery of his complete order when needed.

Should CMP Regulation 5 not cover his requirements, help your prospect prepare and file form PD-1A with his nearest WPB Field office.



TWIN UNIT FAN: Widely used where limited headroom or vertical wall space does not permit use of adequate sized single unit Coolair Fan.

PROMPT SHIPMENT . . . can still be made on many types and sizes of Coolair Fans on orders bearing a priority rating of AA-5 or better.

A full description of the Coolair line, with tables showing models, dimensions, performance data, etc., can be found in
SWEET'S CATALOG A.S.H.V.E. GUIDE
ELECTRICAL BUYER'S REFERENCE

AMERICAN COOLAIR CORPORATION
3604 MAYFLOWER STREET JACKSONVILLE 3, FLORIDA

electric service. He said that the development and promotion of an adequate wiring program should be initiated at the earliest opportunity; better relations should be established with the building industry; and a technical educational program on wiring should be directed to the building industry. A consumer education program on adequate wiring is a definite responsibility of the electrical industry, and he concluded with the prediction that the electrical industries' stake in the postwar housing program will be 15 per cent, a larger share than existed in any previous period.

Industry Needs Courage

In an interesting discussion of the problems ahead of the electric utility companies, Rex I. Brown, president, Mississippi Power & Light Company, and president of the Southeastern Electric Exchange, pointed out that the real problem before the public in so far as private or public ownership of utilities is concerned is a question of management. In either case, he said, the ultimate ownership of the utilities lies with the people and the question is whether the management will be entrusted to train experts or politicians. If the utility companies are to maintain and to improve their position in the postwar years, Mr. Brown concluded, the greatest need of the industry is the courage to fight for its rights.

At the afternoon session of the general conference, S. P. Vecker, Carolina Power & Light Company, Raleigh, in an address entitled "Where Do We Go From Here?" urged power companies to develop basic postwar plans now. In discussing such a plan, he presented a number of specific points that should be given consideration.

Mr. Vecker was followed on the program by Dr. Donald K. Tressler, General Electric Company, Bridgeport, who discussed quick freezing processes and the future possibilities of this new service.

The importance of today's planning for tomorrow's new market potentialities was the subject of Chas. A. Collier, vice-president, Georgia Power Company, Atlanta. The Georgia Power Company is not taking it for granted that they will get their share of the postwar business, Mr. Collier said. Recognizing the inevitable competition for the consumer dollar, he said that investigation and study had shown that among the 250,000 domestic customers of the company there will be a market for electric appliances amounting to 75 million dollars, and definite plans are being made to develop this market.

A comprehensive discussion of postwar distribution problems was presented to the conference by C. E. Greenwood, commercial director, Edison Electric Institute, New York City. In Mr. Greenwood's absence, his paper was read by Paul J. Avery. It presented a summary of postwar opportunities and the corresponding obligations of the utility companies in regard to market development. (Mr. Greenwood's address is presented elsewhere in this issue.)

The second day of the sales conference was devoted to parallel meetings of sales section committees including the residential and commercial committee over which Chairman J. S. Sutherland, sales promotion manager, Alabama Power Company, Birmingham, presided; the advertising committee, with Chairman E. K. Hartzell, assistant to president, East Tennessee Light & Power Company, of Bristol, presiding; the agricultural

development committee, with Chairman J. J. Powell, sales promotion and advertising manager, Mississippi Power & Light Company, Jackson, presiding; and the industrial power committee with P. D. Lawrence, manager of industrial power sales, Virginia Electric and Power Company, Richmond, presiding.

Operating Principles of Electrical Instruments

(Continued from page 26)

ed in the dynamometer, and its power consumption for a given torque is also less. A wattmeter of the electro-dynamic type, typical of those used for general testing purposes, is shown in Fig. 28.

(To Be Continued)

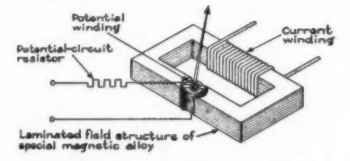


Fig. 27 Schematic construction of electrodynamic wattmeter

Fig. 28. Type AP-9 electrodynamic wattmeter

Contractor Specializes In War-Plant Work

(Continued from page 21)

trucks. The office personnel—comprised of stenographers, repairmen and engineers, has remained comparatively static—"mainly because most of our workmen were over draft age." Workmen for out-of-town contracts have been obtained generally, from union files. The number of employees has varied any-

FLAMENOL Building Wire is not a new and untried product. It was developed before the war and has been used in all sorts of buildings. What is more, wires with Flamenol thermo-plastic insulation have been used for a much longer time—switchboard wire, wire for signal circuits, machine tools, etc. It is approved by the Underwriters'.

Flamenol Building Wire is available now in sizes 14 to 1,000,000 CM. (Resins are permitted for electrical conductor insulation wherever copper is allocated.) Use this wire for the war-purpose jobs you are handling. It is easy to use and will give long service.

For further information see the nearest G-E Merchandise Distributor or write to Section W1231-16, Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn.

***Reg. U.S. Pat. Off.**

Look at the Features

1. Small in diameter — Saves space.
2. Superaging—Long life, no oxidation.
3. Easy pulling — Hard, smooth finish.
4. Heat resistant — Rated 60 deg. C.
5. Free stripping — Speeds splicing and soldering
6. High dielectric strength—720 volts per mil, test result
7. Flame proof — Will not support combustion
8. Insulation — Tensile strength of 2000 lb. per sq. in., test result
9. Many colors—Same range as Type R wires
10. Oilproof — Unaffected by oils, water, acids, alkalies
11. Attractive — Retain fine appearance
12. Self-protecting—No braids necessary

GENERAL ELECTRIC

where from 60, the average pre-war staff, to 150 during the peak of 1942.

The Starr brothers are conscientious in cooperating with the salvage drives that intermittently sweep the country. All unusable materials are turned over to the solicitors for scrap. Very little rejuvenation is done within the organization itself, however. Likewise, they leave innovations and inventions to those "who have a flair for it." But no one is more eager to employ progressive methods when there seems to be profit in the offing.

CMP Regulation 9A

(Continued from page 14)

chinery repair shops, blacksmith shops, electricians, radio repair shops, plumbers, refrigeration repair shops, boiler repair shops, motor rewinders, electrical contractors, automotive repair shops, upholstery repair shops, bicycle repair shops, and carpenters. It also includes repair shops which are owned by the persons for whom the repair work is done if that person can segregate the purchases of his repair shop from his other purchases.

(b) How much materials a repairman can buy. Each calendar quarter a repairman may buy, under this regulation, up to 20 tons of carbon and alloy steel, a total of 500 pounds of copper and copper base alloy brass mill and foundry products, and 200 pounds of aluminum, in the forms listed in Schedule I. (Ed. Note: This schedule is identical in substance with Schedule I of CMP Regulation 1). In addition, refrigeration repairmen, electricians, electrical contractors, and radio repairmen may buy $150 worth of copper wire, or one-eighth of what they used in making repairs in 1941 (figured as accurately as possible by dollar value), whichever is more. A repairman may buy as much other material and repair parts as he needs for his maintenance and repair work.

(c) How to buy materials under this regulation. (1) When buying materials and parts under this regulation a repairman must put on his order a certification in substantially the following form:

CMP Allotment Symbol V-3; Preference Rating AA-3

The undersigned purchaser certifies, subject to the penalties of section 35 (A) of the United States Criminal Code, to the seller and to the War Production Board, that, to the best of his knowledge and belief, the undersigned is authorized under applicable War Production Board regulations or orders to place this delivery order, to receive the items ordered for the purpose for which ordered, and to use any preference rating or allotment number or symbol which the undersigned has placed on this order.

He must sign the certification himself, or as described in Priorities Regulation No. 7. An order for controlled materials bearing this certification is an authorized controlled material order under all CMP regulations.

(2) If a repairman does repair work for persons who have the right to use a preference rating higher than AA-3 to buy non-controlled materials and parts for their own maintenance, and repair, the repairman may use that rating to buy

CHROMALOX

HEATFLO

the replacement electric range unit that SIMPLIFIES YOUR SERVICE PROBLEM

1200-watt and 2000-watt Heatflo units with Snap-on adapter rings enable service man to fit any range. With these units, speedy, one call servicing is the rule. Ideal for replacements, in wartime or any time. Keep 'em cooking, with Chromalox. Write us for details.

Chromalox Range Unit repair parts, available without priority, under WPB limitation orders.

ATLANTA, GA.
C. B. Rogers
100 Peachtree St., N. E.

DALLAS, TEX.
L. R. Ward
403 Southland Bldg. Annex

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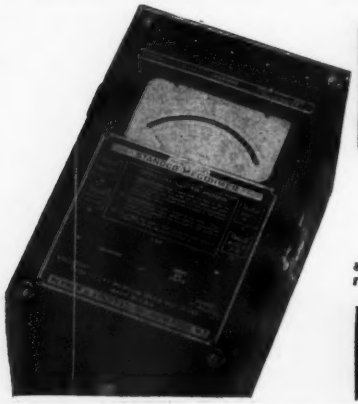
EDWIN L. WIEGAND CO.
7600 Thomas Blvd. Pittsburgh, 8, Penn.



TEST INSULATION THE MODERN, EASY WAY WITH A

MODEL B-5 MEGOHMER

No more tiresome cranking of a hand-driven generator . . .

OUR NEW BATTERY-VIBRATOR TYPE INSULATION TESTERS OPERATE AT A

STEADY TEST POTENTIAL OF 500 VOLTS DC

available at the touch of a switch. Portable, entirely self-contained, direct reading in megohms for insulation resistance and ohms for low resistance testing. Various new models and ranges. Write for bulletin No. 45.

HERMAN H. STICHT COMPANY, INC.
27 PARK PLACE NEW YORK, N. Y.

YOU CAN DEPEND ON

Sepco

1915 - 1943

ELECTRIC WATER HEATERS

ALTHOUGH WAR TIME CONSTRUCTED THEY STILL GIVE THEIR USUAL EFFICIENT, ECONOMICAL PERFORMANCE WITH THEIR LONG LIFE LOW WATTS DENSITY HEATING UNIT, THEIR POSITIVE SNAP ACTION THERMOSTAT AND MOST EFFICIENT HEAT INSULATION MANUFACTURED AND GUARANTEED BY

AUTOMATIC ELECTRIC HEATER CO.

POTTSTOWN, PENNA.

Today, the Merchant Marine is getting the supplies through to the Allied Armies. Their safety and reliability in delivering the goods depends upon the synchronous functioning of electrical equipment.

A film of DOLPH'S Insulating Varnish is playing an important part by protecting the electrical equipment against salt water, oil and corrosive chemicals insuring dependable performance.

Your electrical units too, may be given the same protection. Write today and learn how DOLPH'S Insulating Varnishes can do a better job for you.

Dolph's

JOHN C. DOLPH COMPANY

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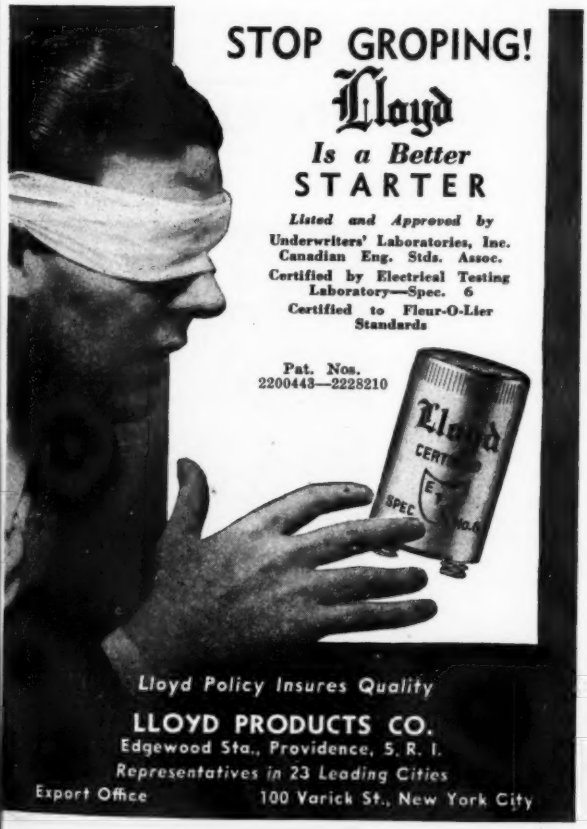

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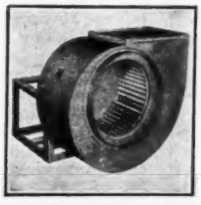

Single Inlet—Double Inlet. 400 CFM to 12,500 CFM.

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he needs to do their work or to replace in inventory what he has already used for that purpose.

(d) How a repairman can get more controlled materials. (1) The War Production Board may authorize repairmen who do work primarily of an industrial nature to buy up to 2000 pounds of copper wire and a total of 2000 pounds of copper and copper base alloy brass mill and foundry products, and to use the preference rating AA-2. To get this authority, a repairman must apply to the War Production Board Reference CMP Regulation No. 9A, Washington (25), D. C., by letter giving information showing what kind of work he is doing, and what kind of customers he has.

(2) If a repairman needs to buy more controlled materials a quarter than he can get under this regulation including what an industrial repairman can get under paragraph (1), he should fill out and send Form CMP-4B to the War Production Board, Washington (25), D. C. The War Production Board may allot him controlled materials and assign him a preference rating. If he gets an allotment, he may not buy any controlled materials or non-controlled materials or parts under this regulation.

(e) What kind of work a repairman may do with materials or parts bought under this regulation. A repairman may use what he buys under this regulation only to do maintenance and repair work. He may not use what he buys to make products, such as repair parts, which he does not expect to use himself in making repairs.

(f) Restrictions on inventory. A repairman may not accept delivery of any item of parts or materials bought under this regulation if his inventory of that item of parts or materials is or would by accepting delivery become larger than he needs to continue his repair and maintenance service for a 60-day period, according to his current method of operation. A repairman may not accept delivery of any item of copper wire if his inventory of that item is or would by accepting delivery become more than he needs for a 15-day period. However, if the supply of any item which he has on hand is less than the permitted amount, he may accept delivery of the smallest commercial amount of that item which his distributor normally sells, even if that will increase his supply beyond the amount specified.

(g) Effect of other orders and regulations. (1) Repairmen buying and using parts and materials under this regulation are subject to all applicable provisions of the other orders and regulations of the War Production Board as amended from time to time. Attention is specifically called to the provisions of Conservation Order M—9—c and M—9—c—4 which limit the use of copper, Order M—1—i which limits the use of aluminum, Order M—126 which limits the use of steel, and Order L—41 which forbids construction (including wiring and piping) except under certain conditions. Information concerning these orders can be secured from the nearest War Production Board field office.

(2) No item appearing on List A or B of Priorities Regulation No. 3, (such as automotive repair parts) may be bought under this regulation.

(3) Certain orders of the War Production Board require special applications for some materials and parts. An example of this type of order is M—328, Textiles. A repairman will not be able to buy these materials and parts under this regulation. Generally his supplier can tell him if a special application is needed.

(h) Communications. Any communications or appeals under this regulation should be made by writing a letter to the War Production Board, Reference CMP Regulation 9A, Washington (25), D. C.

Issued this 25th day of November 1943.

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and sales representation in all or any part of *Ill. - Mich. - Minn. - Wis. Ind. - W. Ohio,* would appreciate opportunity of negotiating with you for present or post-war business.

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YOU'VE JUST BEGUN TO SCRAP

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How to Sell Your Scrap

If you have no regular scrap dealer, find one in the classified phone book. He'll buy usable materials, too; or you can find a Used Equipment Dealer in the same place.

Don't expect your scrap heap to be a gold mine the dealer works under a price ceiling, the same as you do. But you will find there's a million dollar feeling in the knowledge that you're doing your part all the way. It's 100% better than the guilty sensation you get every time you pass some good metal you should have scrapped months ago!

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If you have done a successful salvage job at your plant, send details and pictures to this magazine. Send for booklet — "Primer of Industrial Scrap."

Our Thanks —

We wish to take this opportunity of extending thanks and appreciation to our numerous customers and other friends who have helped us over the hurdles of 1943.

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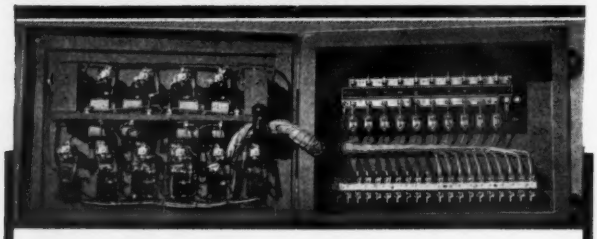

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The Advertisers' Index is published as a convenience, and not as a part of advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

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Aluminum Co. of America
American Coolair Corp.
American Steel & Wire Co.
Anaconda Wire & Cable Co., Inc.
Automatic Electric Heater Co., Inc.

B

Briegel Method Tool Co.
Bryant Electric Co.
Bull Dog Electric Products Co.
Burndy Engineering Co., Inc.
Business Press Industrial Scrap Committee

C

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D

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F

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